1978

Dickey-Lincoln School Lakes Project Environmental Impact Statement: Appendix J: Coordination with Other Agencies & Public Involvement (Supplement)

New England Division

United States Army Corps of Engineers

ENVIRONMENTAL IMPACT STATEMENT

DICKEY-LINCOLN SCHOOL LAKES

APPENDIX J

COORDINATION WITH OTHER AGENCIES & PUBLIC INVOLVEMENT

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS.
02154

1977

Federal Agency Coordination

United States Department of the Interior

NATIONAL PARK SERVICE

NORTH ATLANTIC REGION
150 CAUSEWAY STREET
BOSTON, MA. 02114

IN REPLY REFER TO:
L-7619-NAR-(CE)

July 23, 1975

Colonel John H. Mason
Division Engineer
Department of the Army
New England Division, Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02154

Dear Colonel Mason:

In response to your request for our views on your proposed recreation plan for the Dickey-Lincoln hydroelectric power project, we offer the following comments.

The National Park Service of the U. S. Department of the Interior will be reviewing the draft environmental statement. This agency has the specific responsibility for insuring that the environmental statement clearly defines all potential environmental impacts associated with this project upon natural and cultural values including historical, architectural and archeological.

This agency will be particularly concerned about any impact which this project might have on any existing, proposed or known units of the National Park System, or any known historic, natural or environmental education sites which are currently part of, or eligible for, the National Landmark Program.

In addition, the draft environmental statement must indicate that your Department has consulted with the State Historic Preservation Officer to insure that all possible impacts to sites either on, or potentially to be added to, the National Register of Historic Places have been identified. Consultation should also take place with the State Archeologist to identify potential project impacts on archeological sites.

Sincerely yours,

L. J. Hovig
Acting Regional Director

Dickey-Lincoln EIS Coordination Meeting with Maine Department of Fisheries and Wildlife and U.S. Fish and Wildlife Service

1. On 2 February 1976 Messrs. Barrett, Dyer and NED's terrestrial ecosystems consultant, Dr. Ken Hoover of Environmental Research and Technology, Inc., met with representatives of the Maine Department of Inland Fisheries and Wildlife and the U.S. Fish and Wildlife Service. The major purposes of the meeting were to: (a) inform both agencies of the status, work schedule and proposed methodology for accomplishing the terrestrial impacts assessment; (b) discuss those issues of concern to both agencies in carrying out the terrestrial scope of work; (c) discuss those subject areas where coordination and cooperation in work performance would be of mutual benefit.

2. Significant points of discussion were as follows:

(a) Deer Impacts - In reference to project impacts on the local deer population it was quite apparent that Maine Fish and Game's major concerns were with the level of detail of the field investigations. Maine Inland Fisheries and Wildlife have adequate subjective and qualitative information available in their files which they will make available to us. They felt that intensive quantitative field surveys are needed to adequately address the project's impacts on the deer herd. As an example some recent research has shown that winter deer yards may support deer from an area much larger than originally believed (up to 60 mi. diameter summer range). The project therefore could feasibly impact a much larger portion of the total deer range and subsequent animal population in Northern Maine.

While it was generally agreed that resources are not available to answer the various questions on population dynamics it was pointed out that the limitations and shortcomings associated with the information that is available could certainly be discussed within the EIS. Further discussions with Maine Officials indicated that in their opinion a minimum of five years and upwards of $250,000 would be required to adequately address the deer quantification issue. Realizing that time and money are limited a different approach (possibly as a joint agency effort) will be explored utilizing a methodology developed in other parts of the country but never used here in the Northeast. Such a technique could be a logical extension of the photo-interpretation being done by ERT. The methodology is now being evaluated by ERT and will be discussed at a future meeting with the State. It involves a statistical/subjective evaluation of representative habitat units by a team of foresters, wildlife biologists, etc. Using a system of grid sample evaluations, the field survey information can be extrapolated to address the quantification issue to a greater level of certainty. As a point of interest, the discussion of the impacts on the deer herd occupied the great majority of the meeting.

9 February 1976

SUBJECT: Dickey-Lincoln EIS Coordination Meeting with Maine Department of Fisheries and Wildlife and U.S. Fish and Wildlife Service

(b) Land Use - While the project area does not have a permanent official land use plan at this time the State does have an interim plan and is in the process of officially zoning the project area for the management protection and development of its natural resources by using existing land use laws under the Land Use Regulation Commission.

(c) Field Assistance - Maine Fish and Wildlife personnel (probably one person) are planning to be in the field with ERT to assist and cooperate in data acquisition. It was agreed that in field procedures and data recording forms will be similar to those presently used by the State.

(d) Creel Census and Utilization Study - Inland Fisheries and Wildlife were made aware of our intent to conduct, by contract, a creel census and fisheries utilization study. Such a census is deemed necessary to obtain an assessment of fishermen day utilization and success rate. This information is necessary input to the recreation study as well as the Aquatic Ecosystem Study. Further discussions on this matter are planned with the Department of Inland Fisheries and Wildlife.

(e) Rare and Endangered Species - Surveys for proposed rare and endangered flora (or threatened) within the project boundaries were discussed. Inland Fisheries and Wildlife were not interested in this subject but the U.S. Fish and Wildlife people were. We determined that such a survey would be conducted using NED personnel assisted by a plant taxonomist from the University of Maine and possibly personnel from Fish and Wildlife.

(f) Eagle and Osprey Survey - Discussions were held on the subject of impact on Eagles and Ospreys. We concluded that a survey of nesting sites and active nests were needed. Aerial surveys conducted by personnel from NED, Maine Inland Fisheries and Wildlife and U.S. Fish and Wildlife utilizing helicopters could accomplish this survey within a maximum of 6 flying days.

3. While Maine Inland Fisheries and Wildlife officials may not be satisfied with the intensity of field investigation that will be performed, they at least fully understand our position. They also realize that the information to be generated will be as detailed as they themselves have provided through the past several years. It is our opinion that the scope of work will be responsive to NEPA and that the State was simply looking for an opportunity to carry out more intensive field surveys. We feel that the meeting was pleasant, most constructive and of mutual benefit. Further meetings will be held in the near future to discuss those issues mentioned above.

15 March 1976

Mr. Melvin R. Evans
Area Office Supervisor
U.S. Fish and Wildlife Service
P.O. Box 1518
55 Pleasant Street
Concord, New Hampshire 03301

Dear Mr. Evans:

Inclosed for your information and assistance is the draft report prepared by Normandeau Associates, Inc. on the existing fisheries within the Dickey-Lincoln School Lakes Project Area. Also inclosed is a short memo on the physical characteristics of the streams in the project area prepared by our own Water Control Branch. Please understand that there are some errors in both documents and each should be used accordingly. Completed reports will be available in the fall of 1976.

Sincerely yours,

2 Incls
as stated

JOSEPH L. IGNAZIO
Chief, Planning Division

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UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Post Office and Courthouse Building
BOSTON, MASSACHUSETTS 02109

APR 14 1976

Division Engineer
New England Division
Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02154

Dear Sir:

This letter is intended to assist you in planning for the Dickey-Lincoln project in Maine. We have found that a number of unique, significant or endangered environments appear to occur within, or near, the project area. These areas are noted in Chapter 15, Volume 1, Book Four of "A Socio-Economic and Environmental Inventory of the North Atlantic Region, Sandy Hook to Bay of Fundy", published by the Research Institute of the Gulf of Maine, Box 2320, South Portland, Maine, in November 1974.

In Chapter 15, a number of Figures show sites which may be impacted by the project; these are:

Figure 15-2 - Lakes and Ponds of Unusually High Productivity.

Figure 15-3 - Rare Remnant or Unique Species of Plants.

Figure 15-4 - Unique Plant Communities.

Figure 15-6 - Habitat Area of Rare, Endangered, and Unique Terrestrial Fauna.

Figure 15-10 - Habitat Area of Rare Endangered and Unique Species (Aquatic Fauna).

The Figures are inadequate to determine the precise site locations in relation to the project, therefore additional investigations will be needed. We believe that the impacts of the project upon these sites should be described in the Environmental Impact Statement.

Sincerely yours,

Regional Director

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UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Post Office and Courthouse Building
BOSTON MASSACHUSETTS 02109

APR 20 1976

Division Engineer
New England Division, Corps of Engineers
424 Trapelo Road
Waltham, MA 02154

Dear Sir:

This report is a planning aid for the proposed Dickey-Lincoln Dams and Reservoirs project in Maine.

A number of endangered, rare, or unique animal species are known or suspected to occur in the project area. This report is a "first cut" listing of those species and is subject to addition or deletion as additional information becomes available.

This list divides species into those that have been officially listed as endangered (Federal Register, Vol. 40, No. 188, Friday, September 26, 1975, pp. 44417-44423), but those that are rare or unique and deserving of special attention, but which have not been included on the Federal list. Under Section 7 of the Endangered Species Act of 1973, PL 93-205, the Corps of Engineers should investigate and document the presence or absence of officially listed endangered species, determine the project impacts upon those species, and develop preservation or mitigation measures.

Species considered rare or endangered by the State of Maine also should be considered. The State does not have an official list, but the Corps should contact Mr. Maynard F. Marsh, Commissioner, Maine Department of Inland Fisheries and Wildlife, Augusta, Maine for special information on particular species of interest to that Department.

We have encountered problems in developing this list because of various points of view. For example, some species may not be considered unique or rare in Maine. However, that species may exist only in Maine and may, therefore, be considered of special interest in the other New England states or the eastern United States. For the purpose of this listing we have developed the following notations to assist, insofar as possible, in resolving this problem.

National (Nat): Those species of national interest

Eastern United States (E.U.S.): Those species found in the project

vicinity but never or seldom occur elsewhere in Eastern United States.

Local: Those species which are of special interest within the State of Maine

Information you might obtain on the Endangered species should be retained under administrative confidentiality and provided only to this Service and the Maine Department of Inland Fisheries and Wildlife.

At this time we have insufficient information to determine if the existence of any animal species is threatened by the anticipated impacts of the proposed project. Should your investigations reveal such a possibility, please advise this Service as soon as possible.

MAMMALS

Endangered Species

Indiana Bat - Myotis sodalis

Range - eastern and midwestern USA. This species is reported not to occur in the project area. (Nat)

Eastern Cougar - Felis concolor cougar

Range - eastern USA. Some reports of sightings in project area. (Nat)

Eastern Timber Wolf - Canis lupus lycaon

Range - Minnesota-Michigan, USA. Project area is within a larger area that may be considered for reintroduction depending upon State acceptance and other factors. This does not affect project at this time. (Nat)

Species of Unique or Rare Status

Lynx - Lynx canadensis

Range - project area at southern edge of their range. Reported to be uncommon in the project area and declining in Maine. (E.U.S. and Local)

Moose - Alces alces

Common in project area and in Maine but uncommon in other New England States except for a small population in New Hampshire. (E.U.S.)

Pine Marten - Martes americana

Occurs in project area but population unknown. Center of population in Maine apparently is south of project area. Uncommon elsewhere in east. (E.U.S.)

Northern Bog Lemming - Synaptomys borealis

This species is rare in Maine and may occur in the project area. (Local)

Keen Myotis - Myotis keeni

Status in project area should be determined. (Local)

Eastern Pipistrel - Pipistrellus subflavens

Status in project area should be determined. (Local)

Small-Footed Myotis - Myotis subulatus

Status in project area should be determined. (Local)

Longtail Shrew - Sorex dispar

Status in project area needs to be determined. Rare in Maine. (Local)

Northern Water Shrew - Sorex palustris

Status in project area should be determined. Rare in Maine. (Local)

BIRDS

Endangered Species

American Peregrine Falcon - Falco peregrinus anatum

Range - Canada, USA, Mexico. None known to exist in project area. Presence of historic breeding sites unknown. (Nat)

Species of Unique or Rare Status

Osprey - Pandion haliaetus

Probably occurs in project area. (E.U.S. and Local)

Bald Eagle (Northern) - Haliaeetus leucocephalus alascanus

Known to occur in project area. The Fish and Wildlife Service is reviewing the status of the Bald Eagle, and is considering including on the Endangered Species list those Bald Eagles which breed in New England. (Nat)

Golden Eagle - Aquila chrysaetos

Status in project area needs to be determined. (Nat)

5B

Cooper's Hawk - Accipiter cooperii

Propably occurs in project area. Declining in Maine. (Local)

REPTILES

Endangered Species

None listed that could occur in the project area.

Species of Unique or Rare Status

Wood Turtle - Clemmys insculpta

Status in project area needs to be determined. Species is rare in Maine. (Local)

AMPHIBIANS

Endangered Species

None listed that could occur in project area.

Species of Unique or Rare Status

Mink Frog - Rana septentrionalis

Existence in project area unknown. (E.U.S.)

FISHES

Endangered Species

None listed that could occur in project area.

Species of Unique or Rare Status

Blueback Trout - Salvalinus alpinus oquassa

Does not occur within project proposed pool elevation but occurs in nearby Black Lake, Deboullie Pond, Gardiner Lake, and Pushineer Pond, totalling 752 acres and located on the Fish River Lake topographic quadrangle. This species is found only in the State of Maine. In Maine it occurs in 11 water bodies totalling 5,046 acres. Therefore, the four ponds comprise about 36 percent of its range in number of water bodies and about 15 percent of its range in acres. The Deboullie Mountain area was originally proposed as a borrow area for the project fill, but apparently is no longer being considered. There are no other occurrences of

this species in the St. John drainage. (Nat)

MOLLUSKS

Endangered Species

None listed.

Species of Unique or Rare Status

None identified at this time.

INSECTS

Endangered Species

None listed.

Species of Unique or Rare Status

None identified at this time.

Sincerely yours,

Acting Regional Director

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Post Office and Courthouse Building
BOSTON MASSACHUSETTS 02109

APR 23 1976

Division Engineer
New England Division
Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02154

Dear Sir:

In order to aid in planning the Dickey-Lincoln, Maine project, we have assembled some information on the endangered, threatened and potentially threatened plant species of Maine. This is an initial effort to identify the endangered or threatened plant species that may be impacted by the project.

On July 1, 1975, the U. S. Fish and Wildlife Service published in the Federal Register a list of threatened or endangered species identified by the Smithsonian Institution for the purpose of reviewing their status. Because the final official list will be published later this year, determination of impacts upon the listed species and other plant species that will be affected by the project is necessary. Publication of the official list is anticipated prior to project construction.

The species identified by the Smithsonian as threatened or endangered, and one species listed as probably extinct, are noted below. In addition, several species not listed but which may be threatened by the project are added.

We understand that you are considering a contract with Dr. Richards of the University of Maine for further work on plants in the project area.

Under Section 7 of the Endangered Species Act of 1973, PL 93-205, the Corps of Engineers should investigate and document the presence or absence of the plant species, determine if the project will have an impact on the species, determine the impacts, and develop preservation or mitigation measures.

Species considered rare or endangered by the State of Maine, also should be considered. The State does not have an official list,

but the Corps should contact Mr. Alec Giffen, Supervisor, Resources Planning Division, State Planning Office, Augusta, Maine.

Because this list is not complete, especially in reference to species indigenous to the project area which may be impacted by the project, and which are not generally considered endangered, additional investigations are desirable.

The Fish and Wildlife Service has developed a procedure to publish, in the Federal Register, those species which may be endangered by projects such as this for the purpose of obtaining more detailed information. We feel that such publication at this time may be premature until you have an opportunity to review their status with other authorities and because there may be other species found to be in the same category. This is to advise you that this opportunity exists to assist in determining the status of any species.

BASIC REFERENCE

"Review of Status of Vascular Plants and Determination of Critical Habitat"; Federal Register, Volume 40, Number 127, July 1, 1975; Part V; Pages 27824-27924.

List "A" - State list of Endangered and Threatened species of the continental United States. Maine, Page 27858.

Maine - Endangered - Cyperaceae - Carex Elachycarpa

"Aroostook Sedge"

"Gravelly beaches of Aroostook River, Fort Fairfield, Maine, July, A Critical Species."

Britton and Brown 1947,; Volume 1, Page 377.

"Springy calcareous shores, Aroostook River, Maine."

Gray's Manual of Botany, Eighth Edition, 1950, Page 316.

Maine - Endangered - Poaceae - Calamagrostis Inexpansa Var. Novae-Angliae

"Damp woods and shaded cliffs, local, e. Me. to n. Vt."

Gray's; Page 316.

A

Maine - Endangered - Ranunculaceae - Trollius Laxus

"American Globeflower"

"In swamps, New Hampshire (?), Connecticut to Delaware, west to Michigan."

Britton and Brown; Volume 2, Page 87.

"Spreading Globeflower"

"Rich meadows and swamps, rare or local, in w. Ct. to Mich., s. to Pa., by old records, n. to w. New Hampshire and w. Me."

Gray's; Page 667.

Maine - Endangered - Scrophulariaceae - Mimulus Ringens Var. Colpophilus

"Gaping Monkey Flower"

"Estuaries of the St. Lawrence system, Que. and the Penobscot R. system, Me."

Gray's; Page 1274.

Maine - Threatened - Asteraceae - Prenanthes Boottii

"Boott's Rattlesnake - Root", (listed as Nabalus Boottii).

"Alpine summits of the mountains of northern New England and New York."

Britton and Brown; Volume 3, Page 337.

"Alpine regions, northern N. E. and n. N. Y."

Gray's; Page 1274

Maine - Threatened - Brassicaceae - Cardamine Longii

"Tidal estuary of Cathance R., Me.; estab. by the late F. F. Forbes on the Charles River, Mass.; estuaries confluent with Chesapeake Bay, Md. and Va."

Gray's; Page 723.

Maine - Threatened - Caryophyllaceae - Paronychia Argyrocoma Var. Albimontana

"Silverling"

"Bare granitic slopes, mts. (or sandy river-banks) of N.H. and w. Me.; ledges near mouth of Merrimac River, Mass., local."

Gray's; Page 612.

Maine - Threatened - Cyperaceae - Carex Oronensis

"Orono Sedge"

"Dry open places, Orono and Bangor, Maine."

Britton and Brown; Volume 1, Page 379.

"Fields, meadows and clearings, Penobscot Valley, Me."

Gray's; Page 327.

Maine - Threatened - Orchidaceae - Listera Auriculata

"Auricled Twayblade", (listed as Ophrys auriculata).

"Cedar swamps and wet banks, Quebec, Maine, New Hampshire and Vermont."

Britton and Brown; Volume 1, Page 568.

"Auricled Twayblade"

"Alluvial banks, calcareous silts or crevices, alder - thickets and arbor - vitae swamps, Nfld. to Ung., and Ontario, s. to Gaspe Pen., Que., n. N. E. and N. Y."

Gray's; Page 482.

Maine - Treatened - Orchidaceae - Platanthera Leucophaea

"Prairie White - Fringed Orchis", (listed as Blephariglottis leucophaea).

"On moist prairies, Nova Scotia to Minnesota, Kentucky, Louisiana and Nebraska."

Britton and Brown; Volume 1, Page 558.

"White Fringed Orchis", (listed as Habaneria blephariglottis).

"Wet boggy or peaty soil, S. C. to Nfld., P.E.I., N.B., n. N.E. and s. Que., thence inland to Muskuka District, Ont. and Mich."

Gray's; Page 473.

List "A" Modifications of May 21, 1975:

Maine - Endangered - Orchidaceae - Isotria medeoloides

"Small Whorled Pogonia"

"Dry woodland, very rare, local and in small colonies, N.H. and Vt., s. to N.C.; se. Mo."

Gray's; Page 476.

Maine - Threatened - Cyperaceae - Scirpus longii

"Meadows, swamps and fresh marshes, locally abundant, e. N.C., s.

N.J. to e. Mass.; w. N.S."

Gray's; Page 276.

Maine - Threatened - Orchidaceae - Cypripedium arietinum

"Ram's head Ladies-slipper"

"In cold and damp woods, Quebec to Montana, Massachusetts, New York and Minnesota."

Britton and Brown; Volume 1, Page 548.

"Ram's head Lady-slipper"

"Damp or mossy woods or bays, s.w. Que. to Man., s., rarely, to n.N.E., centr. and w. Mass., N.Y., Mich., Wisc. and Minn."

Gray's; Page 466.

Maine - Threatened - Orchidaceae - Platanthera flava

"Tubercled Orchis", (listed as Perularia Flava).

6D

"In moist soil, Nova Scotia and Ontario to Minnesota, Florida and Louisiana and Missouri."

Britton; Volume 1, Page 552.

"Pale Green Orchis", (listed as Habenaria flava).

"Swampy woods, boltonland, swales and wet shores, Fla. to e. Tex., n. to Md., Ky., s. Ind. and e. Mo., Yarmouth and Queni Cos., N.S."

Gray's; Page 471.

List "C" Recently Extinct or Possibly Extinct Plant Species in the Continental United States:

Pedicularis furbishiae - Aroostook Co., Maine 1943 - PrEx (probably extinct).

"Miss Furbish's Pedicularis"

"In swamps and along streams, Maine and New Brunswick."

Britton; Volume 3, Page 222.

"Banks of St. John R., n. N.B. and N. Me."

Gray's; Page 1299.

Plant Species occurring St. John River, Maine. (Possibly subject to serve impact from project construction.)

Carex josselynii (Fern).

"Meadows and damp shores, St. John R., n. Me.; late June, July."

Gray's Manual of Botany, Eighth Edition, 1950, Page 316.

In addition, the "Scope of Work" Volume II, September 1975, prepared for the Corps of Engineers, New England Division, mentioned six plant species which should be considered, including Pedicularis Furbishiae indicated above. The remaining five are:

Goodyera oblongifolia Raf.

"Menzies Rattlesnake Plantian"

Listed as Pesamium docipiens.

"In woods, Quebec to British Columbia, New Hampshire, Michigan, Arizona and California, August."

Britton; Volume 1, Page 570.

"Giant or Menzies Rattlesnake Plantain"

"Dry coniferous or mixed woods, n.c.b.; Gaspe Pen. to n. N.B., n. Me. and Montmorency lo.; Que.; Brvie Pen to Algoma Distr., Ont., s. to n. Mich. and n. Wisc.; s. Colo. and se. Utah to N.M. and Ariz.; nw. Mont. and s. B.C., s. along mts. to Calif., July, August."

Gray; Page 481.

Osmorrhiza chilensis - H. & A.

"Western Sweet Cicily"

Listed in Britton and Brown as Washington divaricata.

"Woodlands, Quebec to New Hampshire; Manitoba to South Dakota, British Columbia, Utah and California, May - June."

Britton; Volume II, Page 628.

"Woodlands and clearings, Nfld. to Alaska, s. to N.S., n. Me., n. N.H., Ont., n. Mich., n. Wisc., S.D., Ariz., and Calif., late May - July."

Gray's; Page 1092.

Astralagus alpinus (Var. Brunetianus Fern.)

"Alpine Milk Vetch"

"On rocks, Maine and Vermont to Newfoundland and Labrador, West to Alaska and British Columbia, south in the Rocky Mountains of Colorado.

Also, in northern Europe and Asia, June."

Britton; Volume II, Page 382.

"Calcareous ledges and gravels, Restigouche R. system, Que. and N.B. and Me.; Kennebec R., Me., Conn. R., N.H. and Vt., June - September."

Gray's; Page 910.

6F

Oxytropis johannensis - Fern

"Yellow or Field Oxytrope"

"In rocky and gravelly places, Quebec, northern Maine and New Brunswick to Labrador and Hudson Strait. Also in Europe. Summer, consists of several races, differing in size and in color and size of flowers."

Britton; Volume II, Page 390.

"Calcareous rocks and gravels, w. Nfld. to James Bay, s. to St. Paul's I., N.S., St. John R., N.B. and Me., and Levis Co., Que., June - July."

Gray's; Page 913.

Tanacetum huronense var johannense Fern.

(This variety not listed in Britton & Brown.)

"Gravels and sands of St. John and Restigouche Rivers and tributaries, Que., N.B. and Me., June - August."

Gray's; Page 1518.

Sincerely yours,

Acting Regional Director

NEDPL-R

26 May 1976

Mr. Melvin R. Evans
Area Office Supervisor
NEAO, U.S. Fish and Wildlife Service
55 Pleasant Street
Concord, New Hampshire 03301

Dear Mr. Evans:

In reference to your correspondence of 12 April 1976, I would like to make the following observations on the proposed list of fishes found in the proposed Dickey-Lincoln Project Area.

1. Lake Trout: Our consultants found no specimens of this species in their sampling program. It is not expected to be present within the impact area of the reservoir as there are no lakes with sufficient depth or water to support a population. The closest known population is reported from Togue Pond.

2. Blueback Trout: Our consultants were unable to locate any specimens of the Blueback Trout in spite of an intensive effort to locate them. We seriously question their presence within the project area. There are no documented reports on their presence within the reservoir area.

3. Lake Whitefish: This fish has the same requirements for habitat as does the Lake Trout. We were unable to find any lakes within the reservoir of sufficient size and depth to support a population of this species.

4. We concur with your estimates on the questionable status for the Blacknose Shiner, Redbreast Sunfish and Pumpkinseed Sunfish. Our consultants found none nor could they find any documentation of their presence.

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NEDPL-R 26 May 1976
Mr. Melvin R. Evans

5. Although we have not found any American Eels or Yellow Perch to the present time, we feel they should be included.

6. We would add to the list the Burbot Lota lota. This species was relatively abundant in the streams and river. This species could become a sizeable (both in numbers and physically) member of the reservoir community.

As we receive comments and information on the remainder of species lists, we will pass them along to you.

Sincerely yours,

JOSEPH L. IENAZIO
Chief, Planning Division

NEDPL-R 8 June 1976

Mr. Melvin R. Evans
Area Office Supervisor
U.S. Fish & Wildlife Service
P.O. Box 1518
55 Pleasant Street
Concord, New Hampshire 03301

Dear Mr. Evans:

The attached list of critical plants in the St. John River Basin was prepared by Dr. Charles Richards, Professor of Botany at the University of Maine. As you will note only four species of the eleven listed are coincident with those species noted on the draft plant list of 23 April prepared by your office.

Dr. Richards and Mr. Dyer of my staff will be conducting field investigations for the eleven species listed during the week of 28 June - 2 July and 26 - 30 July.

Sincerely yours,

Incl
As Stated

JOSEPH L. IGNAZIO
Chief, Planning Division

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NEDPL-R

18 March 1976

Dr. Charles Richards
Department of Botany and Plant Pathology
University of Maine
Orono, Maine 04473

Dear Dr. Richards: School

In recent conversations between yourself and Mr. Richard Dyer, of my staff, you expressed an interest in assisting the New England Division in a botanical field survey for endangered or threatened flora in the Dickey-Lincoln Project Area. This letter will serve to more fully describe the nature and intent of the botanical survey.

Recognizing that it is not possible within existing limitations to field check the entire project area, which is approximately 88,000 acres, specific sites will be selected and investigated for the presence of endangered or threatened floral species. The results of the survey will be incorporated into the Environmental Impact Statement for the Dickey-Lincoln School Lakes Project.

The investigation will focus on those plants on the draft list of endangered floral species developed by the U.S. Fish and Wildlife Service and currently being reviewed by the Maine Department of Inland Fisheries and Wildlife.

It is our intention to conduct the required work in approximately two weeks total field time. In order to coincide with the flowering characteristics of the species under consideration two or three different field trips are planned beginning the month of June. We are also currently coordinating with the Maine State Planning Office and are examining the possibility of using the same Field Data Recording Forms and Procedures as called for in the Maine Critical Areas Program.

Services required of you will be those associated with the proper identification and taxonomic classification of those species within the project area which are considered to be endangered or threatened

NEDPL-R 18 March 1976
Dr. Charles Richards

and a short report describing the results of the survey.

If you accept to participate in the survey, formal contractural procedures under a purchase order agreement will be sent to you for your approval and signature.

Sincerely yours,

JOSEPH L. IGNAZIO
Chief, Planning Division

7A

UNIVERSITY OF MAINE at Orono

Department of Botany and Plant Pathology

Deering Hall
Orono, Maine 04473
207/581-7861 581-7930

June 1, 1976

Mr. Richard Dyer
Department of the Army
New England Div., Corps of Engineers
424 Trapelo Road
Waltham, MA 02154

Dear Dick:

Here is a list of the most critical plants to be looked for in the St. John River Basin.

Hedysarum alpinum var. americanum
Oxytropis johannensis
Astragalus alpinus var. brunetianus
Anemone multifida
Juncus alpinus
Tanacetum huronense var. johannense
Pedicularis furbishiae
Castelleja septentrionalis
Primula mistassinica
Astragalus blakei
Primula laurentiana

I will bring herbarium specimens of most of these along to use for comparison. We have no specimen in the Maine herbarium of Astragalus blakei, so if you do get a chance to get to the Gray or New England Botanical Club herbaria at Harvard, be sure to check this one out for identifying characteristics and for localities where found.

I will be looking forward to see you June 22.

Sincerely,

Charles D. Richards
Professor of Botany

CDR:jk

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Post Office and Courthouse Building
BOSTON, MASSACHUSETTS 02109

JUL 7 1976

Division Engineer
New England Division
Corps of Engineers
424 Trapelo Road
Waltham, MA 02154

Dear Sir:

The information contained in this report is intended to aid you in your planning for the proposed Dickey-Lincoln project, Maine.

We believe that as complete a list as possible of plant and animal species found in the project area will be a pertinent part of the Environmental Impact Statement and will help in project evaluation.

The attached partial and preliminary faunal list includes mammals, amphibians, reptiles, fish and birds. Those species marked for special attention include endangered, rare, or unique species, and their status is listed separately.

Some species on the list need to be verified as to their presence or absence and their status in the project area, especially the birds. Additional species may need to be added or some deleted if their presence or absence is verified. A draft of this list was reviewed by the Maine Department of Inland Fisheries and Wildlife, Maine Audubon Society, Frank Gramlich, U.S. Fish and Wildlife Service, and personnel of your Division. Their suggestions were incorporated.

At this time, we have insufficient information to determine if the existence of any faunal species is threatened by anticipated impacts of the proposed project. Should your investigations reveal such a possibility, please advise me as soon as possible.

We plan no further action in listing flora or fauna in connection with this project.

Sincerely yours,

Regional Director

(PRELIMINARY)

MAMMALS PRESENT OR SUSPECTED TO BE PRESENT IN THE PROPOSED DICKEY-LINCOLN PROJECT AREA

June 25, 1976

	Presence Questionable	Special Attention
Masked Shrew (Sorex cinereus)		
Smoky Shrew (Sorex fumeus)		
Longtail Shrew (Sorex dispar)	?	X
Northern Water Shrew (Sorex palustris)		X
Artic Shrew (Sorex arcticus)	?	
Pygmy Shrew (Microsorex hoyi)		
Shorttail Shrew (Blarina brevicauda)		
Starnose Mole (Condylura cristata)		
Hairytail Mole (Parascalops breweri)		
Little Brown Myotis (Bat) (Myotis lucifugus)		
Keen Myotis (Myotis keeni)	?	X
Indiana Myotis (Myotis sodalis)	?	X
Silver-Haired Bat (Lasionycteris noctivagans)		
Small-Footed Myotis (Myotis subulatus)	?	X
Big Brown Bat (Eptesicus fuscus)		
Eastern Pipistrel (Pipistrallus subflavus)	?	X
Red Bat (Lasiurus borealis)		
Hoary Bat (Lasiurus cinereus)		
Black Bear (Ursus americanus)		
Raccoon (Procyon lotor)		
Marten (Martes americana)		X
Fisher (Martes pennanti)		
Shorttail Weasel (Mustela erminea)		
Longtail Weasel (Mustela frenata)		
Mink (Mustela vison)		
River Otter (Lutra canadensis)		
Striped Skunk (Mephitis mephitis)		
Eastern Coyote (Canis latrans var.)		
Red Fox (Vulpes fulva)		
Eastern Cougar (Felis concolor cougar)	?	X
Lynx (Lynx canadensis)		X
Bobcat (Lynx rufus)		
Woodchuck (Marmota monax)		
Eastern Chipmunk (Tamias striatus)		
Eastern Gray Squirrel (Sciurus carolinensis)	?	
Red Squirrel (Tamiasciurus hudsonicus)		
Northern Flying Squirrel (Glaucomys sabrinus)		

	Presence Questionable	Special Attention
Beaver (Castor canadensis)		
Deer Mouse (Peromyscus maniculatus)		
Southern Bog Lemming (Synaptomys cooperi)	?	
Northern Bog Lemming (Synaptomys borealis)	?	X
Boreal Redback Vole (Clethrionomys gapperi)		
Meadow Vole (Microtus pennsylvanicus)		
Muskrat (Ondatra zibethica)		
Meadow Jumping Mouse (Zapus hudsonius)		
Woodland Jumping Mouse (Napaeozapus insignis)		
Porcupine (Erethizon dorsatum)		
Snowshoe Hare (Lepus americanus)		
Whitetail Deer (Odocoileus virginianus)		
Moose (Alces alces)		X

(PRELIMINARY)

REPTILES & AMPHIBIANS PRESENT OR SUSPECTED TO BE PRESENT
IN THE PROPOSED DICKEY-LINCOLN PROJECT AREA
June 25, 1976

	Presence Questionable	Special Attention
Amphibians		
Frogs and toads		
Mink Frog (Rana septentrionalis)	?	X
Northern Leopard Frog (Rana pipiens pipiens)		
Pickerel Frog (Rana palustris)		
Wood Frog (Rana sylvatica)		
Green Frog (Rana clamitans melanota)		
Bull Frog (Rana catesbeiana)	?	
Northern Spring Peeper (Hyla crucifer)		
Eastern Gray Tree Frog (Hyla versicolor)	?	
American Toad (Bufo americanus)		
Salamanders		
Red Spotted Salamander (Diemictylus viridescens)		
Spotted Salamander (Ambystoma maculatum)		
Blue Spotted Salamander (Ambystoma jeffersonianum)	?	
Dusky Salamander (Desmognathus fuscus)	?	
Northern Spring Salamander (Gyrinophilus porphyriticus)	?	
Northern Two-Lined Salamander (Eurycea bislineata)		
Red-Backed Salamander (Plethodon cinereus)		
Four-Toed Salamander (Hemidactylium scutatum)	?	
Reptiles		
Turtles		
Common Snapping Turtle (Chelydra serpentina)	?	
Wood Turtle (Clemmys insculpta)	?	X
Eastern Painted Turtle (Chrysemys picta picta)	?	
Midland Painted Turtle (Chrysemys picta marginata)	?	
Snakes		
Northern Red-bellied Snake (Storeria occipitomaculata)	?	
Northern Brown Snake (Storeria dekayi)	?	
Northern Water Snake (Natrix sipedon)	?	
Northern Ringneck Snake (Diadophis punctatus)	?	
Northern Black Racers (Coluber constrictor)	?	
Eastern Garter Snake (Thamnophis sirtalis)		
Eastern Ribbon Snake (Thamnophis sauritus)	?	
Eastern Green Snake (Opheodrys vernalis)	?	
Eastern Milk Snake (Lampropeltis doliata triangulum)	?	

(PRELIMINARY)

FISH PRESENT OR SUSPECTED TO BE PRESENT IN THE
PROPOSED DICKEY-LINCOLN PROJECT AREA
June 25, 1976

	Presence Questionable	Special Attention
Landlocked Salmon (Salmo salar)		
Brook Trout (Salvelinus fontinalis)		
Blueback Trout (Salvelinus oquassa)		X
White Sucker (Catostomus commersoni)		
Longnose Sucker (Catostomus catostomus)		
Blacknose Dace (Rhinichthys atratulus)		
Fallfish (Semotilus corporalis)		
Lake Chub (Couesius plumbeus)		
Creek Chub (Semotilus atromaculatus)		
Pearl Dace (Semotilus margarita)		
Finescale Dace (Phoxinus neogaeus)		
Northern Redbelly Dace (Phoxinus eos)		
Fathead Minnow (Pimephales promelas)		
Common Shiner (Notropis cornutus)		
Golden Shiner (Notropis crysoleucas)		
Blacknose Shiner (Notropis heterolepis)		
Brown Bullhead (Ictalurus nebulosus)		
American Eel (Anguilla rostrata)		
Yellow Perch (Perca flavescens)		
Slimy Sculpin (Cottus cognatus)		
3-Spine Stickleback (Gasterosteus aculeatus)		
9-Spine Stickleback (Pungitius pungitius)		
Burbot (Lota lota)		

(PRELIMINARY)

BIRDS PRESENT OR SUSPECTED TO BE PRESENT IN THE PROPOSED DICKEY-LINCOLN PROJECT AREA
June 25, 1976

	1/ Status	Presence Questionable	Special Attention
Common Loon (Gavia immer)	B		
Red Throated Loon (Gavia stellata)	D		
Red Necked Grebe (Podiceps nigricollis)	D		
Horned Grebe (Podiceps auritus)	D		
Pied-Billed Grebe (Podilymbus podiceps)	B		
Canada Goose (Branta canadensis)	B		
Snow Goose (Chen hyperborea)	D		
Mallard (Anas platyrhynchos)	B	?	
Black Duck (Anas rubripes)	B		
Pintail (Anas acuta)	D	?	
American wigeon (Mareca americana)	D	?	
Blue-Winged Teal (Anas discors)	B	?	
Green-Winged Teal (Anas carolinensis)	B	?	
Wood Duck (Aix sponsa)	B		
Ring-Necked Duck (Aythya collaris)	B		
Greater Scaup (Aythya marila)	D		
Lesser Scaup (Aythya affinis)	D		
Common Goldeneye (Bucephala clangula)	B		
Bufflehead (Bucephala albeola)	D		
White-Winged Scoter (Melanitta deglandi)	D		
Surf Scoter (Melanitta perspicillata)	D		
Ruddy Duck (Oxyura jamaicensis)	D		
Common Merganser (Mergus merganser)	B		
Red-Breasted Merganser (Mergus serrator)	D		
Hooded Merganser (Lophodytes cucullatus)	B	?	
Goshawk (Accipiter gentilis)	B		
Coopers Hawk (Accipiter cooperii)	B	?	X
Sharp-Shinned Hawk (Accipiter striatus)	B		
Marsh Hawk (Circus cyaneus)	B		

1/ A - Winter Range
B - Summer or Breeding Range
C - Occurs all year
D - Migratory through the project area
E - Occasional visitor

	1/ Status	Presence Questionable	Special Attention
Rough-Legged Hawk (Buteo lagopus)	D	?	
Red-Tailed Hawk (Buteo jamaicensis)	B		
Red-Shouldered Hawk (Buteo lineatus)	B		
Broad-Winged Hawk (Buteo platypterus)	B		
Golden Eagle (Aquila chrysaetos)	A	?	X
Bald Eagle (Haliaeetus leucocephalus)	B		X
Osprey (Pandion haliaetus)	B		X
Sparrow Hawk (American Kestrel) (Falco sparverius)	B		
Peregrine Falcon (Falco peregrinis)	D	?	X
Merlin (Falco columbarius)	D	?	
Spruce Grouse (Canachites canadensis)	C		X
Ruffed Grouse (Bonasa umbellus)	C		
Great Blue Heron (Ardea herodias)	B		
American Bittern (Botaurus lentiginosus)	B		
Virginia Rail (Rallus limicola)	B		
Sora (Porzana carolina)	B		
Yellow Rail (Coturnicops noveboracensis)	D	?	
American Golden Plover (Pluvialis dominica)	D		
Black-Bellied Plover (Pluvialis squatarola)	D		
Semipalmated Plover (Charadrius semipalmatus)	D		
Killdeer (Charadrius vociferus)	B	?	
Whimbrel (Numenius phaeopus)	D		
Hudsonian Godwit (Limosa haemastica)	D	?	
Solitary Sandpiper (Tringa solitaria)	D		
Spotted Sandpiper (Actitis macularia)	B		
Greater Yellowlegs (Totanus melanoleucus)	D		
Lesser Yellowlegs (Totanus flavipes)	D		
Short-Billed Dowitcher (Limnodromus griseus)	D	?	
Ruddy Turnstone (Arenaria interpres)	D	?	
Dunlin (Calidris alpina)	D		
Sanderling (Crocethia alba)	D	?	
Least Sandpiper (Calidris minutilla)	D	?	
Semipalmated Sandpiper (Ereunetes pusillus)	D	?	
American Woodcock (Philohela minor)	B		
Common Snipe (Capella gallinago)	B		
Herring Gull (Larus argentatus)	D		
Ring-Billed Gull (Larus delawarensis)	D	?	
Bonapartes Gull (Larus philadelphia)	D	?	
Common Tern (Sterna hirundo)	D	?	

IIF

	1/ Status	Presence Questionable	Special Attention
Rock Dove (Columba livia)	C	?	
Mourning Dove (Zenaidura macroura)	B	?	
Black-Billed Cuckoo (Coccyzus erythropthalmus)	B	?	
Yellow-Billed Cuckoo (Coccyzus americanus)	B	?	
Great Horned Owl (Bubo virginianus)	C		
Long-Eared Owl (Asio otus)	B	?	
Short-Eared Owl (Asio flammeus)	B		
Snowy Owl (Nyctea scandiaca)	D		
Barred Owl (Strix varia)	C		
Great Gray Owl (Strix nebulosa)	E	?	
Hawk Owl (Surnia ulula)	E	?	
Boreal Owl (Aegolius funereus)	A	?	
Saw-Whet Owl (Aegolius acadicus)	A		
Whip-Poor-Will (Caprimulgus vociferous)	B		
Common Nighthawk (Chordeiles minor)	B		
Chimney Swift (Chaetura pelagica)	B		
Ruby-Throated Hummingbird (Archilochus colubris)	B		
Belted Kingfisher (Megaceryle alcyon)	B		
Yellow-Shafted (Common) Flicker (Colaptes auratus)	B		
Pileated Woodpecker (Dryocopus pileatus)	C		X
Yellow-Bellied Sapsucker (Sphyrapicus varius)	B		
Hairy Woodpecker (Dendrocopos villosus)	C		
Downy Woodpecker (Dendrocopos pubescens)	C		
Black-Backed Three-Toed Woodpecker (Picoides arcticus)	C		
Northern Three-Toed Woodpecker (Picoides tridactylus)	C	?	
Eastern Kingbird (Tyrannus tyrannus)	B		
Great Crested Flycatcher (Myiarchus crinitus)	B		
Eastern Phoebe (Sayornis phoebe)	B		
Yellow-Bellied Flycatcher (Empidonax flaviventris)	B		
Alder Flycatcher (Empidonax alnarum)	B		
Least Flycatcher (Empidonax minimus)	B	?	
Eastern Wood Pewee (Contopus virens)	B		
Olive-Sided Flycatcher (Nuttallornis borealis)	B		

	1/ Status	Presence Questionable	Special Attention
Horned Lark (Eremophila alpestris)	A	?	
Barn Swallow (Hirundo rustica)	B	?	
Cliff Swallow (Petrochelidon pyrrhonota)	B		
Tree Swallow (Iridoprocne bicolor)	B		
Bank Swallow (Riparia riparia)	B		
Blue Jay (Cyanocitta cristata)	B		
Gray Jay (Perisoreus canadensis)	C		
Common Raven (Corvus corax)	C		
Common Crow (Corvus brachyrhynchos)	B		
Black-Capped Chickadee (Parus atricapillus)	C		
Boreal Chickadee (Parus hudsonicus)	C		
White-Breasted Nuthatch (Sitta carolinensis)	C	?	
Red-Breasted Nuthatch (Sitta canadensis)	B		
Brown Creeper (Certhia familiaris)	B		
Winter Wren (Troglodytes trcglodytes)	B		
Robin (Turdus migratorius)	B		
Catbird (Gray Catbird) (Dumetella carolinensis)	B		
Hermit Thrush (Hylocichla guttata)	B		
Swainsons Thrush (Catharus ustulata)	B		
Gray-Checked Thrush (Catharus minima)	B		
Veery (Catharus fuscescens)	B		
Eastern Bluebird (Sialia sialis)	B	?	
Golden-Crowned Kinglet (Regulus satrapa)	B		
Ruby-Crowned Kinglet (Regulus calendula)	B		
Water Pipit (Anthus spinoletta)	D		
Bohemian Waxwing (Bombycilla garrulus)	D		
Cedar Waxwing (Bombycilla cedrorum)	B		
Northern Shrike (Lanius excubitor)	A		
Loggerhead Shrike (Lanius ludovicianus)	B		
Starling (Sturnus vulgaris)	B		
Solitary Vireo (Vireo solitarius)	B		
Red-Eyed Vireo (Vireo olivaceus)	B		
Philadelphia Vireo (Vireo philadelphicus)	B	?	
Warbling Vireo (Vireo gilvus)	B	?	
Black and White Warbler (Mniotilta varia)	B		
Tennesee Warbler (Vermivora peregrina)	B		
Nashville Warbler (Vermivora ruficapilla)	B		

	1/ Status	Presence Questionable	Special Attention
Parula Warbler (Parula americana)	B		
Yellow Warbler (Dendroica petechia)	B		
Magnolia Warbler (Dendroica magonolia)	B		
Cape May Warbler (Dendroica tigrina)	B		
Myrtle (Yellow-Rumped) Warbler (Dendroica coronata)	B		
Black-Throated Green Warbler (Dendroica virens)	B		
Black-Throated Blue Warbler (Dendroica caerulescens)	B		
Blackburnian Warbler (Dendroica fusca)	B		
Chestnut-Sided Warbler (Dendroica pensylvanica)	B		
Bay-Breasted Warbler (Dendroica castanea)	B		
Blackpoll Warbler (Dendroica striata)	B		
Palm Warbler (Dendroica palmarum)	B		
Ovenbird (Seiurus aurocapillus)	B		
Northern Waterthrush (Seiurus noveboracensis)	B		
Yellowthroat (Geothlypis trichas)	B		
Mourning Warbler (Oporornis philadelphia)	B		
Wilsons Warbler (Wilsonia pusilla)	B		
Canada Warbler (Wilsonia canadensis)	B		
American Redstart (Setophaga ruticilla)	B		
House Sparrow (Passer domesticus)	B		
Bobolink (Dolichonyx oryzivorus)	B	?	
Eastern Meadowlark (Sturnella magna)	B	?	
Red-Winged Blackbird (Agelaius phoeniceus)	B		
Rusty Blackbird (Euphagus carolinus)	B		
Common Grackle (Quiscalus quiscula)	B		
Brown-Headed Cowbird (Molothrus ater)	B		
Scarlet Tanager (Piranga olivacea)	B		
Rose-Breasted Grosbeak (Pheucticus ludovicianus)	B		
Evening Grosbeak (Hesperiphona vespertina)	C		
Pine Grosbeak (Pinicola enucleator)	C		
Purple Finch (Carpodacus purpureus)	B		
Hoary Redpoll (Acanthis hornemanni)	A		
Common Redpoll (Acanthis flammea)	A		
Pine Siskin (Spinus pinus)	B		
American Goldfinch (Spinus tristis)	B		
Red Crossbill (Loxia curvirostra)	C		
White-Winged Crossbill (Loxia leucoptera)	C		

	1/ Status	Presence Questionable	Special Attention
Rufous-Sided Towhee (Pipilo erythrophthalmus)	B	?	
Savannah Sparrow (Passerculus sandwichensis)	B	?	
Sharp-Tailed Sparrow (Ammospiza caudacuta)	D	?	
Vesper Sparrow (Pooecetes gràmineus)	D	?	
Slate Colored (Dark-Eyed) Junco (Junco hyemalis)	C		
Tree Sparrow (Spizella arborea)	A		
Chipping Sparrow (Spizella passerina)	B	?	
White-Crowned Sparrow (Zonotrichia leucophrys)	D		
White-Throated Sparrow (Zonotrichia albicollis)	B		
Fox Sparrow (Passerella iliaca)	D		
Lincoln's Sparrow (Melospiza lincolnii)	B	?	
Swamp Sparrow (Melospiza georgiana)	B		
Song Sparrow (Melospiza melodia)	B		
Lapland Longspur (Calcarius lapponicus)	A		
Snow Bunting (Plectrophenax nivalis)	A		

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
CENTER FOR DISEASE CONTROL

BUREAU OF LABORATORIES
VECTOR-BORNE DISEASES DIVISION
POST OFFICE BOX 2087
FORT COLLINS, COLORADO 80522

July 28, 1976

Dr. B. E. Barrett
New England Division, Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02154

Re: NEDPL-R

Dear Dr. Barrett:

We refer to Mr. Ignazio's letter of July 21, 1976, in which he requested our advice concerning the probable impact of the Corps of Engineers' proposed Dickey-Lincoln School Lakes project upon disease vectors and public health. From the information provided, we can surmise that creation of the impoundment may result in the development of mosquito breeding habitats around the margin of the reservoir. A rising water level during the period of spring refill could result in the production of floodwater Aedes mosquitoes in the surcharge zone.

Presumably, the shoreline would be kept relatively free of emergent vegetation during the summer months as a result of the normal summer drawdown. Although the so-called "bath tub ring" produced by this drawdown (page 9 of Fact Sheet) may be aesthetically displeasing, it does discourage mosquito production around the margin of the lake during the summer period.

The piece of correspondence with Public Health Service, Region I, dated March 15, 1967, indicates that blackflies are prevalent throughout the area during the warm-weather months. It is possible that the regulated stream flow in the St. John River resulting from releases from the reservoir may provide favorable blackfly breeding habitats below the dam. Blackfly larvae require well oxygenated water characteristic of rapidly flowing streams and suitable substrates for attachment (submerged rocks or partially submerged, overhanging vegetation) in water depths generally not exceeding 6 centimeters.

Please let us know if we can be of further assistance.

Sincerely yours,

Richard O. Hayes

Richard O. Hayes, Ph.D., M.P.H.
Chief, Water Resources Branch

cc: Mr. Arthur B. Harper

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FEDERAL POWER COMMISSION
REGIONAL OFFICE
26 Federal Plaza
New York, New York 10007

July 28, 1975

Colonel John H. Mason, Corps of Engineers
Division Engineer
Department of the Army
New England Division, Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02154

Dear Colonel Mason:

We have reviewed your recreation concept for the Dickey-Lincoln Project, contained in your letter of July 16, 1975, and it appears sound. It contains the type and format of recreational use and development normally associated with Federal Power Commission licensed hydroelectric projects involving combined private and government interests.

It is suggested that further detailed input to your plan be coordinated with our office and the U.S. Department of Interior's - Bureau of Outdoor Recreation (BOR), Philadelphia, PA. The BOR has worked closely with the FPC in reviewing the recreation aspects at licensed projects. Thus, the coordination of recreational facilities throughout the region can be effectuated.

We appreciate the opportunity to comment on the above matter.

Sincerely,

A. M. Monaco
Regional Engineer

13

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
USDA Office Building, University of Maine, Orono, Maine 04473

July 29, 1975

Colonel John H. Mason
New England Division
Corps of Engineers
424 Trapelo Road
Waltham, Mass. 02145

Reply to: NEDPL-R

Dear Col. Mason:

We appreciated the opportunity of reviewing your concept paper and having the fact sheets on the Dickey-Lincoln hydroelectric power project. As you are well aware, there are many existing values associated with the St. John River that would be lost to the Dickey-Lincoln hydroelectric power project.

The project, as described in your concept paper and fact sheet, would create numerous values. People of the State of Maine and this nation have much to consider in reaching a decision on this project. Certainly you are to be complimented on your efforts to bring out all of the facts for public consideration. This area needs resource development, jobs, and an economical source of energy.

The Dickey-Lincoln hydroelectric power project must be carefully considered to ensure that it is part of a sound solution to Maine's and the nation's electrical problems and is compatible to Maine's plans for the future.

Sincerely,

Warwick M. Tinsley, Jr.
State Conservationist

United States Department of the Interior

OFFICE OF THE SECRETARY
NORTHEAST REGION
JOHN F. KENNEDY FEDERAL BUILDING
ROOM 2003 J & K
BOSTON, MASSACHUSETTS 02203

September 10, 1975

Colonel John H. Mason
Division Engineer
U. S. Army
Corps of Engineers
New England Division
424 Trapelo Road
Waltham, Massachusetts 02154

Dear Colonel Mason:

Your letter of July 16 requested that the Department's Bureau of Outdoor Recreation review and comment on a concept paper on the potential recreation qualities offered by the proposed Dickey-Lincoln hydroelectric power project. With verbal agreement from your office in response to my letter of July 31, the time line for a Department of Interior response was extended to the end of August. Accordingly, the following review comments are offered for your consideration. Please keep in mind that these comments constitute neither an endorsement or non-endorsement of the project; specifically, they are the Department's views regarding the concept paper only.

The Maine Statewide Comprehensive Outdoor Recreation Plan (SCORP) which is the guide for acquisition and development programs to preserve Maine's natural resources and to provide outdoor recreation facilities for its residents and visitors notes that its Planning Region 8 which includes Aroostook County and the Dickey-Lincoln project area has a priority need for community based day-use facilities. With regard to meeting recreation needs for boating, sailing and canoeing at broad water areas, such as lakes and ponds, the Maine SCORP recommends improved access to existing water bodies.

It is more than likely that the recreation objective as outlined in the concept paper can be achieved at far less cost at existing underutilized lakes in Maine. Achievement of a satisfactory angling experience at Dickey Lake will require fish hatchery and rearing

facilities and intensive fisheries management. The value of the resulting recreation should be measured against the cost of achieving it, and comparing it with costs to more fully utilize existing resources. The result of this comparison will probably show that it is more practical to provide a "North Maine Woods semi-wilderness recreation area" at an existing underutilized lake.

We do hope that any detailed future analysis of recreational benefits attributed to a semi-wilderness area will take into count the following:

1. Consideration and evaluation of existing large acreages of lake surface and woodlands in Maine which are not fully utilized and which could provide the same recreation experience.

2. Evaluation of the recreation potential without the project over the 100 year project life.

3. Comparisons and displays of differences (benefits and losses) of recreation values under with project and without project conditions.

In conclusion, I would like to draw your attention to the information provided in Appendix M to the North Atlantic Regional Water Resources Study (NAR) completed in 1972. This study concluded that "The construction of reservoirs, either as single purpose recreation projects, or in conjunction with flood control appears unwarranted" to meet northern Maine's recreation needs through the year 2020.

Thank you for the opportunity to review and comment on the concept paper and for extending the review period.

Sincerely yours,

Roger Sumner Babb
Special Assistant to
the Secretary

NEDPL-B 27 October 1976

Mr. Paul Nickerson
Endangered Species Coordinator
U.S. Department of the Interior
Fish and Wildlife Service
Post Office and Courthouse Building
Boston, Massachusetts 02109

Dear Mr. Nickerson:

As you are aware this office has recently conducted a field survey for rare and unusual plants in the St. John River watershed in support of the Environmental Impact Statement for the Dickey-Lincoln School Lakes Project.

Inclosed for your information and retention is a copy of the final report which presents the results of that survey. Under auspices of the Endangered Species Act of 1973 and as we agreed at our meeting on the 5th of August 1976, we would formally notify your Regional Director of any endangered plants within the Dickey-Lincoln project area when the endangered plant list is finalized and published.

Sincerely yours,

Incl
As stated

JOSEPH L. IGNAZIO
Chief, Planning Division

16

NEDPL-R

24 November 1976

Mr. Howard N. Larsen
Regional Director
Region 5
U.S. Fish and Wildlife Service
One Gateway Center
Newton, Mass. 02158

Dear Mr. Larsen:

This correspondence is to formally request your agency's expertise in a consultation process under Section 7 of the Rare and Endangered Species Act of 1973. As you are aware, we have been conducting various scientific studies in connection with the proposed Dickey-Lincoln School Lakes Project in Maine. One such study has identified the presence of a species of plant which is on the proposed list of plants for endangered classification. The species is the Furbish's Lousewort (Pedicularis Furbishiae).

Our consultant has indicated that this species is known only from the proposed project area and that the project would have a direct impact upon its habitat and survival. Based on this appraisal, I would appreciate your taking action to determine the impact of the project upon the continued existence of the plant and to determine the extent of habitat critical to its survival.

I should note that informal meetings and discussions pertaining to this species have taken place between members of both our staffs. Should you have need of assistance from members of my staff, please contact Dr. B.E. Barrett or Mr. Richard Dyer of my Environmental Analysis Branch.

Sincerely yours,

JOHN P. CHANDLER
Colonel, Corps of Engineers
Division Engineer

17

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
One Gateway Center, Suite 700
NEWTON CORNER, MASSACHUSETTS 02158

IN REPLY REFER TO:

1120-305-44

Division Engineer
New England Division
Corps of Engineers
424 Trapelo Road
Waltham, MA 02154

Dear Sir:

This report is intended to aid you in your planning for the Dickey-Lincoln School hydroelectric project, Maine, which is now in advanced planning stages.

It provides you with the results of appraisals conducted jointly by this Service, the Maine Department of Inland Fisheries and Wildlife, and your agency concerning bald eagle, osprey, peregrine falcon, and great blue heron.

The investigation consisted of three aerial surveys of the project area, consultation with local people, and observations made while engaged in other duties. Representatives of this Service, the State of Maine, Department of Inland Fisheries and Wildlife, and your agency were involved in the survey flights. The purpose of these flights was to locate nests (eyries) or rookeries of these species and determine the presence of individuals.

A routine U.S. Fish and Wildlife Service flight on April 15, 1976 was directed into the St. John River area. Two experienced observers accompanied the pilot on this flight. No bald eagle nests were found, but one roosting bald eagle was seen.

On June 15, 16, and 17, 1976 flights were made by helicopter throughout the project area. Observers on the flights consisted of Corps of Engineers and State personnel. The June 15 flight included the Little Black River and Rocky Brook drainages from their mouths to the Canadian border. No nests were seen, and only one osprey was observed near the mouth of the Little Black River. On June 16 a flight was made over the St. John

River from Fort Kent to Nine Mile Brook. Four osprey nests, of which two were active, and one inactive great blue heron rookery were located. On June 17 two flights were made which covered the Big Black River drainage, from its mouth to the Canadian border and the north and south shoreline of the St. John River from the Big Black River upstream to Nine Mile Brook. Two active osprey nests and one heron rookery, consisting of two active nests, were found in the Big Black River. One inactive osprey nest was found on the St. John River.

In summary, the June 15-17 flights observed a total of nine ospreys and four active osprey nests during flights of about 8.5 hours. Two heron rookeries were observed. No bald eagles or peregrine falcons or their nests were seen.

Information as to possible nests were graciously provided by Mr. John Sinclair of the Seven Islands Land Company. On October 19, 1976 personnel of the Corps of Engineers and the Maine Department of Inland Fisheries and Wildlife investigated the six sites where nests or eagles were reported. Dates of observations, back to 1939 were provided and special attention was paid to 1975 and 1976 sightings. No nests were located in five and one-half hours of flight time. A Great Blue Heron nest is known to be located within one-half mile of the location of a reported eagle nest and could have been mistaken for an eagle nest; at another site a large ball of spruce and mistletoe could be mistaken for a nest from a distance. An area up to one mile from each reported location was checked. A new location of a Great Blue Heron nest was found.

In addition to the above specific searches for birds or nests, Corps of Engineer personnel during the past two years have reported observations of several eagles and ospreys in the project area.

As a result of the investigations it is felt highly probable that peregrine falcon, an endangered species, is not found nesting within the area to be inundated. Transient birds may use the area during spring and fall migration, but there is no direct evidence that this occurs. During the Summer of 1976, three Great Blue Heron nesting sites were found within the proposed impoundment area, as were four active osprey nests. No effort was made to search out other heron nests, therefore, the three rookeries must be considered as a minimum. Occasional observation of eagles, which appear to be visitors to the area, were reported during the summer. Since the eagle is of outstanding interest, a few additonal notes about the eagle population in Maine are in order.

Maine's eagle population is concentrated along the southeast coastal and east central section of the state. Only two nesting territories are known to exist in the northern third of the state, despite the number of large lakes and river systems. Eagles are seen infrequently throughout northern Maine during the summer and a few unknown nests may exist in the Fish River chain or the Allagash waters. The closest known active nest is on Eagle Lake, T8R12, Piscataquis County, about twenty miles from the boundary of the proposed project. We conclude that as of this time, there is no evidence of bald eagle nesting in the proposed impoundment area or its vicinity.

The following is taken from the article by Marshall, David B. and Paul R. Nickerson, for further explanation of the national status of the bald eagle*.

> "With many people working for eagle preservation and with eagle decline apparently checked, the question must be asked whether the bald eagle should be called an endangered species. To understand this issue, both the bald eagle's taxonomic classification and legislation pertaining to endangered species passed by Congress must be understood. Even before the turn of the century it was recognized that bald eagles from Alaska averaged 10 to 15 percent larger than bald eagles from Florida. There is no clear breaking point between the smaller birds in the south and larger ones in the north because the size change is gradual. Nonetheless, as allowed by biological classification systems. the southern birds were designated southern bald eagles (Haliaeetus leucocephalus leucocephalus) and the northern birds as bald eagles (Haliaeetus leucocephalus alascanus). The boundary between the two subspecies was vaguely defined but followed approximately the Maryland/Pennsylvania boundary in the East and the Oregon/California line in the West.
>
> The Endangered Species Preservation Act of 1966 called for a formal list of endangered species for the United States. Subspecies were recognized for the list, and the southern bald eagle was listed. The fortieth parallel for want of a more definitive boundary, was set as the northern edge of the southern bald eagle's range. This boundary actually split a population in northern California. The northern bald eagle did not qualify for the list because of large numbers in Alaska and Canada.
>
> The Endangered Species Act of 1973 changed the criteria for listing and provided for listings within any significant part of an animal's range. This change opens the way for possible listing of the bald eagle south of Canada, or in certain other geographical areas regardless of taxonomic status. The biologically unsound fortieth parallel can now be replaced with a more practical boundary.
>
> The U.S. Fish and Wildlife Service is currently reviewing the bald eagle relative to just such a reclassification under the new Endangered Species Act. It could list some populations as "threatened", a new category under the act that means "likely to become endangered". Certainly the Maine population, which

* Marshall, David B. and Paul R. Nickerson; 1976; "The Bald Eagle: 1776-1976"; National Parks and Conservation Magazine, July 1976 (reprint).

is not currently listed, deserves special consideration. The Fish and Wildlife Service will be seeking and reviewing scientific data on possible reclassification of the bald eagle throughout its range. Although this discussion considers only federal endangered species actions, some states have endangered species acts that recognize both southern and northern bald eagles under various labels, depending upon the state."

Without-the-project (a period of 100 years from the date of construction of the dams) it is expected that generally the project area will remain in forest management for forest products. Moderately increased human use is expected, however. Osprey and Great Blue Heron populations will remain about at the current level with possibly some fluctuations from year-to-year.

With-the-project the area will be dominated by the two large reservoirs, the dams, pool fluctuations, and with great increases in human activity. We believe that the osprey numbers can be expected to increase slightly, as will heron breeding numbers. The magnitude of the increase of these species will be dependent upon the presence or absence of suitable nesting sites and food conditions.

The impact of the proposed pool upon bald eagle is controversial. It is our considered estimate that the project, if constructed, will not enhance the eagle population; at least for many years to come, if ever. The existing scarcity of nesting eagles in northern Maine, in spite of large natural lakes, is a negative indication. Ospreys and eagles are water-orientated and include fish as a major part of their diet. The new lake is not expected to develop adequate populations of fish for some time, therefore, any increase of fish-eating birds will be slow. Addition of another lake is not expected to change eagle breeding habits or numbers.

The above conclusions are based upon limited available data and are subject to reevaluation and modification if new information is provided.

Before any clearing is done, should the project be constructed, investigations are necessary from elevation 910 upwards to locate trees or groves, having a potential as nest sites for osprey or eagles. Such trees should be protected including an adequate buffer zone. There is no certainty that the trees would be used, but this is the only way to encourage such use. If this is not accomplished, such potential nesting sites could be cut for timber or during land clearing. The object is to preserve what appears to be the best potential nest sites.

We believe that flights over the project area by trained observers should be continued. The studies should consist of at least two flights annually and the purpose is to determine presence and utilization patterns of eagles, osprey, peregrine falcons, and herons. Nesting and production survey flights should be made in April and June respectively. The flights should be continued until the project is abandoned or for at least five years after the pond is filled. This Service and the Maine Department of Inland Fisheries and Wildlife is conducting a raptor study of this nature and coverage of the project area can be included at little cost.

We recommend that:

(1) Potential nesting sites for eagles and ospreys be protected; and

(2) Investigations of raptor and Great Blue Heron nesting areas be continued to the fifth year after the pool is filled or until the project is abandoned.

Sincerely yours,

Regional Director

18 D

NEDPL-R 10 February 1977

Mr. Melvin R. Evans
Area Office Supervisor
U.S. Fish and Wildlife Service
P.O. Box 1518
55 Pleasant Street
Concord, New Hampshire 03301

Dear Mr. Evans:

In support of the Environmental Impact Statement for the Dickey-Lincoln School Lakes Project we are preparing to conduct additional field surveys this summer for rare and unusual plants in the St. John River Watershed. The species of Pedicularis furbishiae and Carex josselynii will be the focus of the second phase of our field investigations.

Inclosed for your information, comments and suggestions is a rough draft of the scope of work for these additional studies. We would appreciate the opportunity to meet in the near future with members of your staff to discuss additional details and possible modifications to the scope.

Sincerely yours,

Incl
As stated

JOSEPH L. IGNAZIO
Chief, Planning Division

NEDPL-R 7 April 1977

Mr. Howard N. Larsen
Regional Director
U.S. Fish and Wildlife Service
One Gateway Center
Suite 700
Newton Corner, Massachusetts 02158

Dear Mr. Larsen:

This correspondence is to formally request consultation under Section 7 of the Endangered Species Act of 1973. The endangered species is the Eastern Mountain Lion, Felis concolor cougar and the project is the proposed Dickey-Lincoln School Lakes project.

The Federal Register, Vol. 40, No. 188, lists this species as endangered in the State of Maine. Correspondence from your office on 20 April 1976 and 17 February 1977 indicates that it potentially inhabits the project area.

We request that you make determinations on the following:

1. Impact of the proposed project upon the existence and survival of the species.

2. Extent of impact upon the habitat for that species.

3. A determination as to whether or not the impact upon the habitat involves habitat critical to its survival.

Should you have any questions or require further information on this subject, please contact Mr. B. E. Barrett of my staff.

Sincerely yours,

JOHN P. CHANDLER
Colonel, Corps of Engineers
Division Engineer

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UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
One Gateway Center, Suite 700
NEWTON CORNER, MASSACHUSETTS 02158

IN REPLY REFER TO:

APR 15 1977

Colonel John P. Chandler, Division Engineer
Corps of Engineers
Department of the Army
424 Trapelo Road
Waltham, Massachusetts 02154

Dear Colonel Chandler:

In response to your request for consultation about the effects of Dickey-Lincoln School Lakes Project on the Eastern Cougar (Felis concolor cougar), our biological opinions are:

1. The proposed project will not affect either the existence or the continued survival of the Eastern Cougar.

2. Obviously the habitat will be impacted, but measuring the extent of impact other than by indicating acres lost would be impossible. The key question here is, "To what extent do cougars inhabit and use the area?" In our judgement the area is used little, if at all, by them; thus they would not be impacted if it were modified.

3. The habitat is not now considered critical to the survival of the Eastern Cougar, nor is it likely to be so designated within the foreseeable future.

I believe these opinions satisfy the consultation requirements under Section 7. If we can be of further service, please let us know.

Sincerely yours,

ACTING Regional Director

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NEDPL-R 18 April 1977

Mr. Larry Wright
Division of Environmental Services
Bureau of Outdoor Recreation
Federal Building
600 Arch Street
Philadelphia, Pennsylvania 19106

Dear Mr. Wright:

Please find inclosed a copy of the Draft Report on the Recreation Plan for the Dickey-Lincoln School Lakes Project in Maine, as requested in your recent telephone conversation with Mr. Douglas Cleveland of my staff. This draft report was prepared by the Northern Maine Regional Planning Commission under contract for the Corps of Engineers. A copy of our review comments to the Planning Commission is attached to the report.

If BOR would care to offer any comments regarding the content of this report, we would appreciate hearing from you at your earliest convenience. The Planning Commission will submit their final revised report to the Corps by 20 May 1977. Please feel free to contact Mr. Cleveland if you have any questions concerning the potential recreation plan for Dickey-Lincoln School Lakes.

Sincerely yours,

2 Incl

JOSEPH L. KEBALIO
Chief, Planning Division

22

NEDPL-R 18 April 1977

Mr. Melvin H. Evans
Supervisor
Northeast Area Office
U.S. Fish and Wildlife Service
55 Pleasant Street
Concord, New Hampshire 03301

Dear Mr. Evans:

Pursuant to a telephone conversation between you and Mr. Barrett on 11 April 1977, we are initiating an interagency transfer of funds for the purpose of funding two aerial surveys for raptors in the Hickey-Lincoln School Lakes Project Area. The total amount of funding not to exceed $800 will cover flights in April and May, 1977 and a written report to this office on the findings of the survey.

Sincerely yours,

JOSEPH L. DEBBZIO
Chief, Planning Division

NEDPL-R 28 April 1977

Mr. Howard N. Larsen
Regional Director
Region 5
U. S. Fish and Wildlife Service
One Gateway Center, Suite 700
Newton Corner, Massachusetts 02158

Dear Mr. Larsen:

This correspondence is to inform your office of the botanical studies we are planning to perform this summer with respect to the proposed endangered plant, the Furbish lousewort, Pedicularis furbishiae S. Wats. To expand our knowledge of the species, the studies will focus on two major facets. The first will be an expansion of the geographical area of analysis to include other rivers in northern Maine and western New Brunswick that were not surveyed in 1976. We are presently in the process of contracting with Dr. Richards of the University of Maine, Dr. Harold Hinds of the University of New Brunswick and Dr. George Stirrett of Grand Falls, New Brunswick to assist us in these surveys. A copy of the scope of services requested of Dr. Stirrett is attached for your information. The contracts with Drs. Richards and Hinds will be somewhat similar.

Secondly, we are preparing to conduct various physiological studies on the Furbish lousewort's methods of reproduction, symbiotic associations and physical/chemical requirements. We are negotiating with Dr. Lazarus W. Macior of the University of Akron in Akron, Ohio to perform these investigations. Dr. Macior has studied the genus Pedicularis for the past ten years in North America and is considerably informed of its ecological relationships. A copy of the proposed scope of work for the physiological studies is attached for your review and comment.

Based on an April 19, 1977 telephone conversation between Messrs. Shaw and Nickerson of your staff and Mr. Richard Dyer of the New England

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NEDPL-R 28 April 1977
Mr. Howard N. Larsen

Division, it is our understanding that an authorizing permit issued by the U. S. Fish and Wildlife Service will not be necessary to perform these studies. This will also hold true when the plant is officially listed as an endangered species. Your acknowledgement of this understanding and a formal concurrence and approval of these studies would be sincerely appreciated.

All necessary investigations will be conducted during the months of June-August 1977 and we will make every effort to keep you informed of our progress. The results of these studies should prove invaluable in making your critical habitat determination as required under auspices of Section 7 of the Endangered Species Act.

Sincerely yours,

Incls
As stated

JOHN P. CHANDLER
Colonel, Corps of Engineers
Division Engineer

4A

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
One Gateway Center, Suite 700
NEWTON CORNER, MASSACHUSETTS 02158

IN REPLY REFER TO:

MAY 17 1977

Colonel John P. Chandler, Division Engineer
Corps of Engineers
Department of the Army
424 Trapelo Road
Waltham, Massachusetts 02154

Dear Colonel Chandler:

In response to your letter of April 28, 1977 detailing your proposed fieldwork on Pedicularis furbishiae, we offer the following comments:

(1) No Endangered Species permit is necessary for the work now or when the plant is listed.

(2) Based on the material you have attached and the project discussions at a planning session we attended in Orono, Maine, we believe the scope of work is biologically feasible and should provide much of the information needed for a better impact assessment. However, because we are dealing with a potential Endangered Species, we ask that you specify in the contract exactly how many plants can be taken for the physiological studies, and that someone in your office keep track of the locations that these plants are taken from.

Thank you for the opportunity to review the scope of work. Please keep us appropriately advised as the fieldwork proceeds.

Sincerely yours,

Howard D. Woon
ACTING
Regional Director

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ADDRESS ONLY THE DIRECTOR
FISH AND WILDLIFE SERVICE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
WASHINGTON, D.C. 20240

In Reply Refer To:
FWS/OES Sp

JAN 16 1977

Colonel John P. Chandler
Corps of Engineers
Department of the Army
New England Division
424 Trapelo Road
Waltham, Massachusetts 02154

Dear Colonel Chandler:

I have received your correspondence dated April 28, 1977. The studies you have proposed should add considerably to our knowledge of the biology of the Furbish lousewort, Pedicularis furbishiae, and I most certainly would approve your initiation of these studies.

I would caution you, however, to insure that during the course of these studies that taking of the plants be held to an absolute minimum. Although there are no taking prohibitions for plants in Section 9(a)(2) of the Endangered Species Act, excessive taking might jeopardize the continued existence of this species. If the species is determined as an Endangered species or a Threatened species, excessive taking under the direction of your agency may be in conflict with the directives of Section 7. You are correct in your understanding that no Federal permit is required for the kind of activities you have described.

Our Service would encourage efforts to establish new populations of the Furbish lousewort in suitable habitat within the historical range. However, we would recommend that such efforts be made using only seeds or appropriate cultivated plants. As there are few of these plants left in the wild, they should not be used for transplanting experiments.

Sincerely yours,

Charles K. Shamis

Acting Associate
Director

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NEDPL-R 14 July 1977

Mr. Howard N. Larsen
Regional Director
U. S. Fish and Wildlife Service
One Gateway Center
Suite 700
Newton Corner, Massachusetts 02158

Dear Mr. Larsen:

This correspondence is to formally request consultation under Section 7 of the Endangered Species Act of 1973. The endangered species is the Peregrine falcon, (Falco peregrinus) and the project is the proposed Dickey-Lincoln School Lakes project.

The Federal Register, Volume 41, No. 208 lists this species as endangered throughout its entire range. Correspondence from your office on 20 April 1976 and 17 July 1977 indicates that it potentially inhabits the project area.

We request that you make determinations on the following:

1. Impact of the proposed project upon the existence and survival of the species.

2. Extent of impect upon the habitat for that species.

3. A determination as to whether or not the impact upon the habitat involves habitat critical to its survival.

Should you have any questions or require further information on this subject, please contact Dr. B. E. Barrett of my staff.

Sincerely yours,

JOHN P. CHANDLER
Colonel, Corps of Engineers
Division Engineers

DICKEY-LINCOLN HYDROELECTRIC PROJECT, MAINE

Planning Aid Report of the U.S. Fish and Wildlife Service and the Maine Department of Inland Fisheries and Wildlife concerning the impact of the proposed project upon Whitetail Deer.

July 14, 1977

This Planning Aid Report is intended to aid in planning for the Dickey-Lincoln project, Aroostook County, Maine. It depicts the estimated impacts of the plan upon the Whitetail Deer (Odocoileus virginianus) and associated resource values.

This report has been prepared in coordination with the Maine Department of Inland Fisheries and Wildlife, under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.).

The data on which this report is based has been obtained from a report on the terrestrial resources prepared by Environmental Research and Technology, Inc., a contractor to the Corps, and reports of the Maine Department of Inland Fisheries and Wildlife. Information on the general resources and habitats of the project area will not be depicted here. This information is available in other reports.

Deer yards are areas of special ecological significance because, in northern Maine, they are required for survival of deer populations. Yards normally consist of areas of dense coniferous cover, with some shelter from wind, and with peripheral browsing areas. The size of the yards are known to fluctuate from year to year, depending upon variations in snowfall and temperature. Investigations were conducted between 1968 and 1974 during which period all the yards were surveyed once. In 1976 a complete survey of all the yards was made. This was repeated in 1977 with no significant differences in deer yards observed. After another survey in 1978 this report will be modified, if necessary, by this Service.

PROJECT PLAN

Only those aspects of the project plan expected to impact deer yards will be presented, except that Table 1 provides general data.

Construction of the proposed project would result in inundation of a maximum of 86,024 acres at the Dickey Pool and 2,619 acres at the Lincoln School Pool. In addition, 896 acres will be taken up by the five dikes, the two dams, and developments associated with both the dikes and the dams, including 100 acres for recreation areas. The numbers of acres that will be taken up by new roads resulting from the project are not known. About 2,561 acres will be cleared above the maximum Dickey Pool.

WITHOUT-THE-PROJECT

The best estimate of the current deer population is contained in the contractors' report to the Corps concerning terrestrial resources. The data

Table 1: Pertinent Data; Dickey-Lincoln School (Excluding Transmission Lines)

	Dickey		Lincoln School		Total
	Acres	Elev. 1/	Acres	Elev.	Acres
Total Area	123,915	---	3,465	---	127,380 2/
Area of Pools					
Maximum	86,024	910	2,619	620(ult.)	88,643
Shoreline	390 mi.3/	---	32 mi.	---	422
Average Annual	77,992	900	N.A.		
Minimum	53,680	868	1,426	590	55,142
Guide Taking Elevation 4/	89,986	915	2,926	625	92,912
Clearing above max. pool 5/	2,377	913	184	623	2,561
Dikes and assoc. devel.	125	---	---	---	125
Dams and assoc. structures	645	---	126	---	771
Recreation Areas	100	---	0	---	100
New Roads	?	?	?	?	?
Streambed Elevation	---	585	---	540	---
Exposed Areas:					
Average Summer Drawdown	1,612	2 ft.	N/A	N/A	
Average Winter Drawdown	17,705	22 ft.	N/A	N/A	
Max. Daily Fluctuation	N/A	2-3 in.	2,000 ±	6'± init.	
			3,500 ±	10'± ult.	
Max. Annual Fluctuation	32,344	42 ft.6/	1,193	30 ft.	
Total Area Within "2-Mile Limit" 7/					390,118.8
Total Capacity of Max. Pool	7.7 million AF		86,354 AF		
Usable Capacity of Max. Pool	2.9 million AF		59,090 AF		
Average Depth	78 feet		33 feet		
Maximum Depth	325 feet		80 feet		
Drainage Area at Dam	2,725 sq. mi.		4,086 sq. mi.		
Average Discharge at Lincoln School Site			6,600 cfs.		

* * *

1/ Feet, MSL

2/ Includes 5,700 acres in Canada: 4,046 acres surface area and 1,654 acres buffer zone

3/ Including 41 miles of island shoreline

4/ Or 300 feet horizontally from maximum pool elevation, whichever is greater

5/ Between el. 910 and 913 for Dickey Lake and between 620 and 623 for Lincoln School Lake

6/ Once in 41 years of record

7/ Study area generally extending two miles beyond maximum pool levels and does not include Canadian land.

contained therein were obtained from the Maine Department of Inland Fisheries and Wildlife.

The "Impact Area" of 92,200 acres is that area where deer habitat will be lost due to flooding and construction. Almost all of this area is summer deer range and 36,893 acres are deer winter yards. Deer winter habitat in surrounding areas also will be impacted so that a remaining area of 37,187 acres is included in the analysis. This area is designated as the "surrounding area". These deer yards are included in the St. John Region of 684,544 acres as used in Hutchinson's report. 1/

A study of deer yards in the project area reveals that there is a total of 53 yards encompassing 36,893 acres below the 910 elevation. An unknown, but probably a small, acreage lies above elevation 910 and below elevation 913, the clearing limit, and within areas to be disturbed or occupied by dams, dikes, roads, etc. There is a negligible acreage of deer yards in the Lincoln School site.

Because project construction may not commence until 1978, at the earliest, the resources it will impact are those of 1978 and succeeding years, not those of 1976. Therefore, projections of the resource values are necessary, with- and without-the-project, to adequately evaluate them and to obtain equal consideration of the resources in comparison to other project effects. These projections are made for the same period as the primary project benefits, namely 100 years.

Without-the-project, the whitetail deer resource is expected to increase in the future (Table 2). The State Land Use Regulation Commission has zoned deer yards to protect them. We can project that the carrying capacity of yards will be increased through management by the Department of Inland Fisheries and Wildlife in coordination with landowners. The Department's planning guide, "Planning for Maine's Fish and Wildlife Resources", 1975, Volume 1, Big Game, indicates that the deer density and current hunting pressure in WMU2 (western Aroostook County and northern sections of Piscataquis and Somerset Counties) is the lowest in the state. The deer management goals in WMU2 are to maintain deer numbers in balance with normal winter carrying capacity and to increase the hunting pressure by an additional 10,000 hunters to reduce pressures in southern areas of the state.

For analysis, projections are made for the following target years. Year "0" is estimated to be 1978 when construction could start, year "10" is 1988, year "30" is 2008, and year "100" is 2078. Table 2 shows the expected supply and demand should the project not be constructed. Of course, year "0" may not be 1978 if the project construction is delayed. In Table 2, the demand for deer hunting was increased by about 1.0 percent per year over the project life.

1/ Hutchinson, Allen. 1976. "Deer Wintering Survey of St. John River - Dickey-Lincoln Project Area". ME Dept. of Inland Fisheries & Wildlife. Unpubl.

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Table 2. Whitetailed Deer, St. John Region - Without-the-Project

	Year 0	Year 10	Year 30	Year 100
Deer Yards (Acres)				
"Surrounding Area"	37,187	37,187	37,187	37,187
"Impact Area"	36,893	36,893	36,893	36,893
TOTAL	74,080	74,080	74,080	74,080
Numbers of Deer (Fall Population)				
"Surrounding Area"	3,381	3,381	4,132	5,312
"Impact Area"	3,354	3,354	4,099	5,270
TOTAL	6,735	6,735	8,231	10,582
Supply (Man-Days)				
"Surrounding Area"	15,717	15,717	19,220	24,707
"Impact Area"	15,593	15,593	19,065	24,521
TOTAL	31,310	31,310	38,285	49,228
Average Annual		40,721		
Demand (Man-Days)				
TOTAL	18,000	19,900	24,300	48,700
Average Annual		31,865		
Value ($ @ $25/MD)	$450,000	$497,500	$607,500	$1,217,500
Average Annual Equivalent Value		$621,693		

Changes in deer yards are expected. Decreases in the acres per deer from 11 at year 0 to 7 at year 100 is an attempt to approximate anticipated improvements in yard carrying capacity due to intensive forest management. A figure of 31 man-days per deer taken, and an estimated harvest of 15 percent of the deer herd is used in the calculations. 2/

The above changes result in an increase of supply at year 100, measured in potential man-days of hunting of a fall population of 10,582 deer of which 15 percent can be harvested resulting in 49,228 man-days valued at $1,230,700 by year 100. The $25.00 value per man-day is derived from a value of $17.47 per day as determined in the 1970 National Survey of Hunting and Fishing and adding 43% to allow for the Consumer Price Index increase between 1970 and 1975. On the other hand, the meat value, at $1.25 per pound, is $23.34 when allocated to all hunters in Wildlife Management Unit 2. Nineteen thousand hunters took 2,838 deer having an estimated dressed weight of 125 pounds each. The meat value of $443,437.50 divided by the number of hunters, 19,000, equals an average meat value of $23.34. This is a potential value of the deer.

For the purpose of this analysis the estimated demand curve is used because the demand appears to be less than the potential supply throughout the analysis period. The average annual demand is expected to be 31,865 man-days which has an average annual equivalent value of $621,693.

2/ Rounding of figures used in calculations on which tables in this report are based results in slight discrepancies if calculations are made directly from the Tables.

WITH-THE-PROJECT

If the project is constructed it is expected to eliminate, through inundation, construction, clearing, and development activities, at least 92,200 acres of summer habitat for deer and at least 36,893 acres of deer yards (Table 3).

Table 3: Acreages of Deer Habitat to be Impacted by the Project - Estimated

	Dickey	Lincoln School	Total
	Acres	Acres	Acres
Summer Habitat			
Destroyed			
Permanent Inundation (Pools)	86,024	2,619	88,643
Dams, dikes, buildings, recreation areas, other associated activities	871	125	996
Temporary inundated area	(8,000, part of above pool)		
Cleared area above el. 910	2,561		2,561
Minimum Area where impacts will occur from road building, and land use changes	89,456	2,744	92,200
Winter Habitat			
Estimated acreage of deer yards			
"Impact Area"	36,893	negligible	36,893
"Surrounding Area"	37,187	---	37,187
TOTAL			74,080

Loss of these lands will eventually eliminate the population of deer wintering in the "Impact Area", and reduce the deer population in the surrounding area. How far distant from the pool area deer will be affected is not known. Necessary studies have not been undertaken. It is known, however, that deer will travel for long distances to reach winter yards. It is important to note that the "Impact Area" of 92,200 acres has a concentration of deer yards amounting to 36,893 acres, while the remaining St. John Region of 592,344 acres has 37,187 acres of yards. That the yards are concentrated along the streams is shown by the fact that 49.8 percent of the yards are concentrated in only 13.5 percent of the total St. John Region and are located in the project impact area.

During the filling period deer will be forced away from the rising waters. Some deer will find themselves on islands or future islands and these will be able to swim, or travel across winter ice, to the mainland. There will be abundant habitat during spring, summer, and fall in the forests around the pools. During the winter these deer will be forced into remaining yards already supporting maximum numbers of deer. The excess deer will eventually be lost.

28D

The carrying capacity of remaining deer yards outside the project area is expected to be reduced due to overuse by deer that normally would use the yards to be inundated (Table 4). Once the remaining deer yards are overused and overbrowsed it will take many years to recover. Most of those yards that intersect elevation 913 and extend up the slopes will have an additional reduction in carrying capacity due to exposure to winds sweeping across the reservoir pool.

Table 4 depicts the estimated deer yard acreages and man-days use with-the-project. The average annual man-days supply with-the-project will be 19,236 in the St. John Region.

Table 4. Whitetailed Deer, St. John Region - With-the-Project

	Year 0	Year 10	Year 30	Year 100
Deer Yards (Acres)				
"Surrounding Area"	37,187	33,468	35,141	36,898
"Impact Area"	0	0	0	0
TOTAL	37,187	33,468	35,141	36,898
Numbers of Deer (Fall Population)				
"Surrounding Area"	3,381	2,231	3,195	5,271
"Impact Area"	0	0	0	0
TOTAL	3,381	2,231	3,195	5,271
Supply (Man-Days)				
"Surrounding Area"	15,717	10,385	14,849	29,171
"Impact Area"	0	0	0	0
TOTAL	15,717	10,385	14,849	29,171
Average Annual		19,236		
Demand (Man-Days) (Same as W/O Project)				
TOTAL	18,000	19,900	24,300	48,700
Average Annual		31,865		

Beneficial Impacts

There will be no beneficial impacts upon the whitetail deer.

Adverse Impacts That Cannot be Avoided

Adverse impacts that cannot be avoided include the loss of habitat through inundation, construction activity such as roads, construction of dams, dikes, etc., development of recreational areas and increased human activity in the project area.

The degree to which mitigation recommendations are met also determines the extent of the unavoidable loss. The total supply of deer will be reduced, which, without-the-project, could eventually support 49,228 man-days by year 100, and an average annual 40,721 man-days of hunting.

Only a part of the resource loss can be mitigated because of the 100-year period of analysis. For most of that period, the supply exceeds demand and the average annual demand (31,865 man-days) is less than average annual supply (40,721 man-days) (Table 2). Only that portion of the projected demand, based on average annual figures, that will not be satisfied because of the project can be used to estimate mitigation requirements. This figure is the difference between the demand (31,865 man-days) and the supply with-the-project (19,236 man-days) which equals 12,629 man-days. The remaining loss of 8,856 man-days cannot be mitigated (40,721 man-days - 31,865 man-days).

An adverse impact that cannot be avoided is the anticipated loss of approximately 3,300 deer within a short period of one to two years. Deer forced out by rising waters will seek winter shelter in the remaining yards already being used to capacity. This overcrowding of yards could have significant long-range repercussions through reduced winter carrying capacity for many years. The summer season should present no problem to displaced and resident deer.

Adverse Impacts That Can be Mitigated

Anticipated losses that can be mitigated are projected levels of demand minus projected levels of supply. This amounts to an estimated man-day use of 12,629 man-days representing about 407 deer at 31 man-days per deer harvested. This is based on the difference between annualized supply with-the-project and anticipated demand. Since only 15 percent of the herd can safely be harvested every year, this represents a herd of 2,713 deer in the fall.

Summary Assessment

The relationship between short-term use and long-term productivity in the project area appears to be negative should the project be constructed. Long-term production of a high quality recreational endeavor with a possible reward of an edible product will be lost over an indefinite period of time.

Without mitigation the project will cause unavoidable losses of the white-tailed deer resource (Table 5). The estimated loss will amount to 92,200 acres of summer habitat and a maximum loss of 36,893 acres of deer yards. In addition, the carrying capacity of surrounding deer yards will be reduced through overutilization. Without-the-project the project area would be capable of supporting a fall population of 5,270 deer at a rate of one deer per seven acres of deer yard at the end of the 100-year evaluation period. Unfortunately, some of these losses cannot be used for mitigation calculations because the demand is not expected to reach the supply during the analysis period. This loss will occur beyond the 100-year period.

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Table 5. Estimated Losses of Whitetail Deer, St. John Region

	Year 0	Year 10	Year 30	Year 100
Deer Yards (Acres)				
Without Project	74,080	74,080	74,080	74,080
With Project	- 37,187	- 33,468	- 35,141	- 36,898
LOSS	36,893	40,612	38,939	37,182
Deer (Fall Population)				
Without Project	6,735	6,735	8,231	10,582
With Project	- 3,381	- 2,231	- 3,195	- 5,271
LOSS	3,354	4,504	5,036	5,311
Potential Man-Days Use				
Without Project	31,310	31,310	38,285	49,228
With Project	- 15,717	- 10,385	- 14,849	- 29,171
LOSS	15,593	20,925	23,436	20,057

Average Annual Man-Days	
Without Project (Demand)	40,721
With Project (Supply)	- 19,236
LOSS	21,485

Construction of the project would cause losses of a portion of the whitetail deer resource and associated 8,856 man-days of use which would be essentially irretrievable and irreversible, assuming recommended mitigation is achieved. We cannot assume that the resource would be restored over a long time period should the project be constructed, then abandoned. This opinion is based on the severity of the climate, the remoteness of duplicating without-the-project conditions due to changed soil conditions on the floor of the abandoned reservoir.

The measure used to determine mitigation requirements is the loss of a minimum of 12,629 man-days use. At 31 man-days per deer harvested, 12,629 man-days represents about 407 deer. To support this magnitude of harvest a fall population of 2,713 deer is necessary. To mitigate wintering capacity for deer we assume that, through intensive management (which is essentially forest management) the carrying capacity of existing yards elsewhere could be doubled. This would increase the capacity from 11 acres per deer to 5.5 acres per deer. The same area of deer yard would then carry twice as many deer, those already present, and those replacing some of the deer lost.

At 5.5 acres per deer, 25,366 acres would be required to support an additional 2,306 deer (based upon project area populations and subtracting the 407 deer harvested). An additional area, amounting to an additional 25%, would be needed for buffer and food growing areas surrounding the 25,366 acres of deer shelter area. The total area would be 31,708 acres. At an estimated land cost of $100 per acre, a purchase price of $3,170,000 is estimated. The annualized value of this sum is about $107,438 at 3¼ percent. In addition to this first cost, an annual amount of $2.00 per acre for forestry and wildlife management costs, amounting to $63,416, is required, plus $25,000 per year for salaries and equipment. The costs of management should be annually adjusted based upon the Consumer Price Index. The total

average annual cost would be $195,854. The land and management funds are to be provided to the State for management by the Department of Inland Fisheries and Wildlife. The location of these lands has not yet been determined.

We recommend that:

1. The loss of deer yards be mitigated by purchasing and providing to the State of Maine 31,708 acres of deer yards and buffer zone and provision of $88,416 annually to the State Department of Inland Fisheries and Wildlife for management and operation.

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
One Gateway Center Suite 700
NEWTON CORNER, MASSACHUSETTS 02158

IN REPLY REFER TO:

JUL 26 1977

Colonel John P. Chandler, Division Engineer
Corps of Engineers
Department of the Army
424 Trapelo Road
Waltham, Massachusetts 02154

Dear Colonel Chandler:

This correspondence is part of the continuing coordination between our respective agencies about the proposed endangered plant, Pedicularis furbishiae, the Furbish Lousewort.

As mentioned during previous discussions among members of our staffs and as discussed at your December meeting with Regional Director Larsen, the Fish and Wildlife Service cannot begin formal consultation under auspices of the Endangered Species Act until the species in question is officially designated Endangered or Threatened. No plant species have been listed pending finalization and promulgation of the appropriate administrative regulations and permit procedures. These regulations were published in the Federal Register June 24, so plant listings will be forthcoming soon.

When the lousewort is officially designated as an Endangered species, we will initiate formal consultation procedures upon receipt of your written request.

The information being generated this summer by your team of consultants will greatly expedite the consultation process.

Sincerely yours,

ACTING Regional Director

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IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
One Gateway Center Suite 700
NEWTON CORNER, MASSACHUSETTS 02158

JUL 28 1977

Colonel John P. Chandler, Division Engineer
Corps of Engineers
Department of the Army
424 Trapelo Road
Waltham, Massachusetts 02154

Dear Colonel Chandler:

In response to your letter of 14 July 1977 requesting consultation about the effects of the proposed Dickey-Lincoln School Lakes Project on the Peregrine falcon, (Falco peregrinus), our biological opinions are:

1. The proposed project will not affect either the existence or the continued survival of the Peregrine falcon.

2. Although the area to be impacted is within the Peregrine falcon's flyway, to our knowledge there is no historical record of this species nesting within the project area.

3. The habitat in the project area is not now considered critical to the survival of the Peregrine falcon, nor is it likely to be so designated within the foreseeable future.

I believe these opinions satisfy the consultation requirements under Section 7. If we can be of further assistance, please let us know.

Sincerely yours,

Regional Director

ACTING

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IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
One Gateway Center, Suite 700
NEWTON CORNER, MASSACHUSETTS 02158

AUG 4 1977

Division Engineer
New England Division, Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02154

Dear Sir:

Attached is our planning aid report concerning the impact of the Dickey-Lincoln School, Maine, project upon whitetail deer, and providing with- and without-the-project data on deer numbers and deer yards as well as recommended mitigation measures.

This report has been reviewed by your staff and we appreciate their comments.

Sincerely yours,

ACTING Regional Director

Attachment

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
One Gateway Center, Suite 700
NEWTON CORNER, MASSACHUSETTS 02158

AUG 5 1977

Division Engineer
New England Division, Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02154

Dear Sir:

This report is intended to aid you in your planning for the Dickey-Lincoln Project, Maine. It contains the results of two additional survey flights over the project area to determine the extent of eagle, osprey, and other raptor populations.

On April 18, 1977, Pilot Clyde Bolin with Fish and Wildlife Service fixed wing Cessna with floats, flew Pat Corr and Charles Todd, observers, and Linda Wright, observer-photographer, on an eagle and raptor survey of the proposed pool area of the Dickey-Lincoln Project. No eagles or nests were observed. Pat Corr located four of the six osprey nests located last year in the rotary wing aircraft. No new nests were observed; no raptors were noted. Flying time: 6.5 hours.

On April 19, the search flight was continued into areas adjacent to the pool area and to the furthest headwaters of the St. John River and extensively south and west of the project. No eagles or nests were found. Ospreys were common on several flowages. Flying time: 7.1 hours.

The current and 1976 surveys found no evidence of eagle or peregrine nesting territories within or close to the project area.

Flights originated at Old Town Airport in 1977. Except for some early haze, observation and flying conditions were excellent. Search was concentrated on typical eagle nesting habitat -- along rivers, streams, and near bodies of water, old growth timber stands, hillsides and mountains.

Sincerely yours,

ACTING Regional Director

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Maine Historic Preservation Commission

MAINE HISTORIC PRESERVATION COMMISSION
242 State Street
Augusta, Maine 04333

le G. Shettleworth, Jr.
Director

Telephone:
207-289-2133

June 20, 1977

Colonel John P. Chandler
Division Engineer
New England Division
Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02154

Dear Colonel Chandler:

Thank you for your letter of May 31st regarding Dr. David Sanger's cultural resource reconnaissance and intensive survey as a part of the total Advance Engineering and Design Study for the Dickey-Lincoln School Lakes Project.

I have carefully reviewed Dr. Sanger's report, and I agree with him in his assessment of the historic and prehistoric resources of the impact area. Specifically, I find acceptable his designation of eight prehistoric sites and one historic district as being eligible for entry into the National Register of Historic Places, along with the Big Black Site, which is already on the Register. In addition, I am in concurrence with you that his proposed mitigation plan for the resources outlined above is both equitable and financially prudent.

I wish to commend the Corps for its responsible approach toward the identification and potential mitigation of cultural resources in the area of the Dickey-Lincoln School Lakes Project. If I can be of further assistance concerning this matter, please do not hesitate to let me know.

Sincerely,

Earle G. Shettleworth, Jr.

Earle G. Shettleworth, Jr.
State Historic Preservation Officer

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Citizens' Dickey-Lincoln Project Impact
Review Committee

Summary of
Questions and Responses
from the
Citizens Dickey-Lincoln Project Impact Review Committee

There are several questions which were posed at the various Citizens Dickey-Lincoln Project Impact Review Committee's meetings that need to be answered for use in the Environmental Impact Statement. The following questions were gleaned from the list compiled by that committee and submitted to the Corps of Engineers and all committee members.

1. Is the effect of peak load management in Mass. being considered?

   See answer to question 2.

2. Is the effect of peak load management in Maine being considered?

   The effects of peak load management is being considered in the power alternatives studies. These studies, however, do not evaluate the effects by separate states but rather addresses the effects on the New England system as a whole.

3. What is the life of the dam?

   The project life for use in economic analyses is 100 years for Dickey-Lincoln School Lakes Project.

4. Do they count lost taxes and burden on State government in computing benefit-cost ratio?

   Land and Real Estate taxes lost as a result of Government acquisition of lands is included in the annual costs used in computing the benefit-cost ratio. Taxes not realized by the State due to Government implementation in lieu of private development is not included in the analysis.

5. Are intangibles such as wild river weighed in the benefit-cost ratio analyses?

   Intangibles or values which cannot be quantified are not considered in the benefit-cost ratio analysis. These intangibles are, however, addressed in the EIS which is also available to decision makers.

6. How much drawdown will there be for 2 and 1/2 hours of operation?

   The drawdown of the Dickey reservoir would be 1 to 1 1/2 inches as a result of 2 1/2 hours operation of the four initial 190 MW units, depending on the starting pool elevation. In the event that the two additional units were installed, the drawdown would be approximately 1/2 inch greater.

7. How much water will be replenished during a 24 hour period?
   The St. John River at the Dickey Dam site has a great variation in flows, ranging from lows of 1000 cfs (2000 acre feet/day) to highs of 20,000 cfs (40,000 acre feet/day). The annual average is approximately 4600 cfs or 9,200 acre feet/day.

8. How many cubic feet per second flow is required to obtain 280 megawatts?
   For the Dickey Dam generating facilities proposed, it would require approximately 13,000 cfs to generate 280 MW. This will vary depending on the pool elevation of the reservoir.

9. Wants wording on both horizontal and vertical drawdown to be clear and precise. Thus, what is the expected horizontal movement for a daily drawdown?
   It is impossible to present clear and precise language describing the vertical and horizontal movement of the pool shoreline resulting from daily drawdown. The subject becomes most complex when the number of variables are considered. For example: The vertical movement is dependent on the initiating pool elevation, the magnitude of generation during period being considered, and the inflows into the reservoir which are all variables. The horizontal movement is dependent on the varying vertical movement and the slope of the shoreland which varies along the entire 390 mile shoreline.

10. Do we have a study done on the Passamaquoddy within the past 10 years?

No. There is, however, an economic feasibility study currently being accomplished on Passamaquoddy, which is scheduled for completion in May 1977.

11. Is it true that much of the original rationale for the project was the economic development of the area?

No. The original rationale was the development of Tidal Power at Passamaquoddy. Dickey-Lincoln School was conceived as auxiliary power generating source to supplement the output of the tidal power project. The economic impact plan was an integral part of the study.

12. Why were landowners not contacted by the Corps? (This refers to the large timber land owners).

Timber interests have been given briefings by the Corps of Engineers. No formal negotiations, however, would be initiated until decisions pertaining to project implementation have been finalized and construction funds appropriated.

13. There are three dams at Lewiston. These produce 32 Megawatts with a fall of 150 feet. This is 1/2 the fall at Dickey and has a watershed twice that of Dickey. Why is there such a discrepancy (32 Megawatts vs. 760 Megawatts)?

The three dams and associated power production facilities on the Androscoggin River in Lewiston, ME referred to

are apparently "run-of-the-river" plants. They do not have any appreciable storage capacity and the generation facilities are probably size for the lower range of river flows to give relatively continuous output of the installed capacity. During high river flows, these facilities presumably "spill" considerable water not passed through the generating facilities.

Dickey Dam has a large storage capability and therefore, under normal operating conditions, all the river flows are stored and passed through the generating facilities. Further, Dickey Dam is designed as a peaking plant and as such has a high installed capacity to provide large output for relatively short periods of time.

14. Is there a study which gives statistics showing how much wood has been cut from the inaccessible area? Who owns these areas?

See answer to question 15.

15. Is there a study on the use of barges using the proposed reservoir to carry chips to the factory from the inaccessible area?

There are no such studies available at this time for the areas in question. Further, the areas referred to will not be inaccessible. Impoundment crossing could be provided that would access this area to the main tote road network.

16. Is there a study on the trout fishery from Fort Kent to the Dickey damsite?

A study of the downstream river fisheries has been conducted with sampling stations at the mouth of the St. Francis River at Ft. Kent. See Report on Aquatic Ecosystems and Fisheries Analysis.

17. Is there a study on the placement of camps and campsites along the river if the water is stabilized?

Yes. The Northern Maine Regional Planning Commission, under contract to the Corps of Engineers, has prepared a recreational plan for the project area. This plan identifies recommended sites for the potential recreational activities which includes campsites.

18. Is there a study of power purchases from Canada now under contract or as a possibility for the future?

The Power Alternatives studies being prepared for inclusion in the E.I.S. addresses the existing power purchase contracts with New Brunswick, Canada and the future possibility of such contracts.

19. Will Lincoln School dam back up Allagash River?

Yes, the Lincoln School reservoir will extend 3 1/2 miles upstream on the Allagash River. It is noted, however, that the terminous of the Allagash Wild and Scenic River Waterway is 6 miles upstream of the confluence with the St. John River.

20. How will contraction and expansion affect such a long dam?
The Dickey Dam would be an earth fill embankment structure and therefore not subject to the effects of expansion and contractions normally found in concrete or steel structures due to temperature variations.

21. The Kennebec and Androscoggin Rivers have gone to 90' with 120 sq. miles of flooding in 2 and 1/2 hours. What would a phenomenon such as this have on the St. John Valley with the dam?
Dickey-Lincoln School Lakes Project would provide full flood protection to the entire Fort Kent area and other downstream areas in the U.S. under conditions well in excess of historical records.

22. Could Lincoln School provide power for pump storage?
Lincoln School could provide a portion of the power required for pumpback at Dickey Dam. It would not have enough capacity to meet the total requirement and would not be the most economical source of power. The most economical source of pumpback energy would be from large base load units during low system demands.

Collected comments, concerns, or statements made at the Open Comment Meetings October 12-20, 1976 held by C.D.L.P.I.R.C. These sre collected under some general topics to make them a bit more useful and to show where the comment was made.

NEED FOR DICKEY-LINCOLN DISAPPEARS

Bangor

1. Load management, pump storage near loadcenters, rate change will force customers off peak time useage.
4. National conservation ethic developing.

Portland

5. Is the effect of peak load management in Mass. being considered? Is the effect of peak load management in Maine being studied as an alternative?

Augusta

9. Use of conservation, load management, pricing, to reduce power demands.
8. Use of alternatives - pumped storage, solar, gas turbine, wind.
10. 1974 Study of Insulation showed 2 times as much power could be saved as Dickey-Lincoln produces.
42. Alternatives and conservation of energy.

Fort Kent

11. Conserving power rather than using more, an ethic change.
5. Use of alternatives.
12,60,61. Use of alternatives, such as nuclear at sea, coal, solar.
59. Restructure electric rates.
60. Incentive rates to conserve, penalty rates to overuse.
84. Higher rates at peak hours.
85. Conservation
33,34. Power purchase from Canada
63,100. Import from Churchill Falls, - Labrador.
22. Attempting to reduce demand.

MOST OF BENEFITS OUTSIDE OF MAINE

Bangor

2. Canada gets most.

Portland

- - - - - - - - - - -

Augusta

6. Only small part goes to Maine - Long distance to use centers.

Fort Kent

4. Maine bottom of line for power.
54. Same as 4, but because power must first go to public owned companies.
65. Trend of forest products to Canada reversed recently to Eastern Aroostook County, but isolation due to lakes would give benefits back to Canada.
7. Sacrifice too great when we don't get the benefits.
78. Northern Maine beauty should not be destroyed to provide power for Boston.

TROUBLE AT OTHER PLACES DOES NOT ENCOURAGE US.

Bangor
3. History of Alaska oil pipeline.
9. Malaise with burgeoning technology air pollution, interdates, nuclear power.

Portland - - - - - - - - - -

Augusta
43. How long did Teton Dam last?
40. What is life of a dam?

Fort Kent
64. Mactaquec Dam did not prevent flooding in Fredericton, N.B.
87. Boom bust in Alaska over pipeline.
82. Disruption by trucks hauling for dikes at Ft. Kent would be far surpassed by those for the dam.
48. Dams have been known to burst.

LOSS OF WOOD DUE TO FLOODING OR ISOLATION DISRUPT MAINE ECONOMY

Bangor
5. Wood on 88,000 flooded acres suddenly harvested, or harvested not at all.

Augusta
17. 200,000 & 88,000 acres isolated & flooded wood potential lost to Maine.

Fort Kent
12. Lumber potential completely lost.
14. Land west of flooded area no longer accessible.
53. Loss by flood & isolation of woodlands major sacrifice for Aroostook County.

Portland - - - - - - - - - - -

BOOM AND BUST SITUATION IN COUNTY - BAD

Bangor
7. Employment situation has undesirable effects.

Portland - - - - - - - - - - -

Augusta
35. Lost taxes.

Fort Kent
21. Influx of workers cause "boom town".
24. Left Alaska because of "boom town" - don't want it here.
80,84. Influx of workers' pressure for services & recreation, increased violence, crime, prices, lose quiet pleasant town for our children to grow up in.

COST BENEFIT RATIO

Bangor

10. Incorrect interest rates used.

Portland

- - - - - - - - - - -

Augusta

11. Low interest rates give unrealistic cost benefit ratio. Benefits figured over long life vs. costs for construction only (can't count costs on sustained yield on 88,000 acres).
33. Any idea of negative economic impacts?
35. Do cost benefits favor the dam?
Do they count lost taxes & burden on State Government?

Fort Kent

1. Poor financial investment for government.
3. Environmental trade offs too great.
16. Potential cost/benefit by Corps unrealistic.
18. Questions Corps cost/benefit.
48. KWH production 13% of nuclear at Wiscassett but cost is twice as much.
55. Environmental trade offs too great for project to be justified.
63. Flood control attractive fringe benefit but could not justify project.
70. Cost/benefit magic number can be made to favor the compilers of information.
70,71. Corps counts as benefits - power, recreation, flood control; as costs only construction of dams and transmission lines as well as interest charges.
72. Value of 88,000 acres timber loss forever?
73. Fishing & hunting areas lost?
74. Wildlife destroyed, canoeing areas lost?
19. Social costs.
20. Environmental costs.
87,88. Social & environmental costs far outweigh any benefits.
15. Best growing land in valley would be lost (to flooding).

COST BENEFIT RATIO - ESTHETICS, ETC.

Portland

1. Intangibles such as wild river weighed?

Bangor

- - - - - - - - - - -

Augusta

34. Esthetic & environmental loss in computing cost/benefit.
75. Enjoyment of a wild river & untamed area. Monetary value of beauty. Just because these costs are hard to measure does not mean they do not exist.
77. Maine would not be adequately compensated for loss of beautiful area by receiving 100% of power to be generated.
79. Social costs ignored in cost/benefit ratio.

Fort Kent

- - - - - - - - - - -

RECREATION & ESTHETICS

Portland
6. Feeling that recreational opportunities on the river during summer months are being downplayed by proponents of the project.

Augusta
27. Allagash River overpopulated & St. John's River last remote one for white water canoeing.
30. Canoeing & fishing people need recreation & a dream.
50. River and valley beautiful - King LaCroix would not have allowed the dam.

Fort Kent
6. Enjoyed canoe trip down the St. Johns. Would be a waste to turn fast flowing water into a lake.
9. Maine has enough lakes, we wouldlose last large, freeflowing river.
10. Recreational area should be natural rather than artificial. Use of Allagash shows attractiveness.
13. Development would have more meaning as ia, rather than artificial.
16a. Deer & fish habitat lost.
25. People come form far away because of natural beauty not (for) a reservoir.

Bangor - - - - - - - - - -

DRAW DOWN

Augusta
7. Due to draw down, mud flats & "bath tub ring" would occur around the lake.
15. Dickey-Lincoln mileages to Kittery 400, to Quebec 90 - recreational lake for Canadians, not for Mainers.
16,26. We have only 1 St. John River, but many lakes.
19. Worried by changing shore line due to draw-down in a recreational area.
20. How much draw down for 2½ hours of power per day? How much water replenished in reservoir during one day (24 hours)? How many cubic ft/sec to get 280 megawatts? Concern is facts are not known.
21a. Wants both horizontal and vertical movement in a drawdown wording clear in the E.I.S.
24. Undependable summer flow in St. Johns - This year in June his canoe dragged bottom. Large peak in summer due to air conditioning. Drawdown great - replenishment low.

Bangor, Portland, Fort Kent - - - - - - - - - - - - -

SEISMIC ACTIVITIES

Augusta
18. U.S.G.S. Earthquake map shows dam in high risk zone. I.E. Seabrook Power Site in New Hampshire, New Madrid area along Mississippi River, Charleston, South Carolina, Rocky Mountains, Pacific Coastal area.

Fort Kent
23. Concern of seismic activity from fault which would be close to the dam.

Bangor - - - - - - - - - -

QUESTIONS ON OR ABOUT GOVERNMENT

Portland

2. What role can the Governor play in determining whether project is built or not?
3. Why doesn't the Corps have to go through L.U.R.C. and D.E.P.?
4. Did ex-Governor Curtis commit the state for participation in recreation facilities? Could he legally commit the State for action after his term of office was up?

Augusta

1. Contrary to NEPA requirements, inadequate effort for education of public about the project. No attempt for public meetings and individual input.

36,39. Who makes decisions - Congress, Governor, people?

38. Do you have a study done 10 years ago on Quoddy?
52. Those in authority know dam will be built, but withheld information.
8. Would be a federal project with State having no authority.
17. Bill Hathaway's "Billion Dollar Boondoggle"/
43. Would like to envision a Maine Power Authority for Maine alone.
53. Millions of dollars spent on design. Think we people in Maine don't care about waste.

Fort Kent - - - - - - - - - -

Bangor - - - - - - - - - - -

QUESTIONS ABOUT OR TO CORPS

Portland

8. Is it still true that much of the original rationale for the project was the economic development of the area?

Augusta

2. No attempt to check Corps methodology.
58. Meetings on Corps expertise.
12. We don't have resources or expertise to check the (Corps) studies.
13. Corps assumption that project will be built.
14. Name change Dickey-Lincoln Dams to Dickey-Lincoln Lakes to divert attention from economics to recreation potential. Unused lakes in Maine right now.
21. Who is building this (dam)? We don't want another Teton Dam.
29. Question objectivity of the study & people, building the dam.
55. Accused Corps of not one positive answer!
59. Are the contractors of the Corps really objective in their studies.
60. Why were the landowners not contacted by the Corps?
51. Questions are asked by people, but no answers are given by those in authority!
54. Maine people must stand up for their rights and say NO! Don't want to be steamrollered.

QUESTIONS ABOUT COMMITTEE

Augusta

3. Governor's Committee funded by Corps - information furnished by Corps - only 3 meetings so far -- too little, too late.
28. Can committee weigh factors other than economic benefits?

Fort Kent

35. Questioned neutrality of Senator Cyr in making statements 27-34.
37. The River no more of a monster than Cyr who wants to destroy it.
38. Complained about Senator Cyr's comments about the dam, so biased.

Bangor - - - - - - - - - - - -

Portland - - - - - - - - - - - -

CHALLENGE TO CORPS FIGURES ETC.

Augusta

22. 3 dams at Lewiston, 2 for C.M.P., 1 for Bates Mill that produces 32 megawatts with a fall of 150 feet. This is 1/2 fall at Dickey but has a water shed twice that at Dickey. Same generating capacity as at Dickey-Lincoln. Explain discrepancy (32 megawatts at Lewiston vs. 760 megawatts at Dickey.)
45. Dams in Lewiston would fend off shortages.

Bangor - - - - - - - - - -

Portland - - - - - - - - - -

Fort Kent - - - - - - - - - - - -

QUESTIONS TO CORPS

Fort Kent

27. Study giving statistics showing how much wood has been cut from inaccessible area - who owns those areas?
28. Study of barges using reservoir to carry chips to factory.
29. Study of trout fishery all the way from Fort Kent to Dickey Dam.
30. Study of camps on river if water is stabilized.
31. Study of power purchases from Canada now under contract and possibilities for the future.

Portland - - - - - - - - - -

Bangor - - - - - - - - -

Augusta - - - - - - - - - -

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MISCELLANEOUS

Bangor

6. What will residue wood left on bottom of lake do to the lake's ecology?

Portland

7. Roads built during construction might encourage undesired development of the wild lands if they remain open.

Augusta

23. High line losses due to great distance to point of use.
25. Will Lincoln Dam back up Allagash River?
31. Air conditioners alone in N.E. use more energy than 800 million Chinese. Work toward conservation of energy.
32. Build power plants where it is already industrialized, not in wild country.
37. What about your Father's Land? Look at a coin - see words "In God We Trust."
44. How will contraction & expansion effect such a long dam?
46. Kennebec & Androscoggin have gone to 90' with 120 sq. miles of flooding in 2½ hours, what would an effect like this have in St. Johns Valley with the dam?
47. Could Lincoln School Dam supply power for pumped storage?
60. We (land owners) have a multi-use area 1. trees, 2. recreation, 3. road system (400 miles) access with regulation. Allagash River taken over by State Parks, perhaps we could have managed it better.

Fort Kent

26. Would like more people to state views.
36. Man most cruel of all animals.
39. For the dam
    40. Include flood control for Fort Kent.
    41. Control soil erosion.
    42. Future power for Maine.
    43. Have Maine Power Authority for Maine alone.
    44. Not flooding all of Maine, just 88,000 acres.
    45. We are selfish - should consider all N.E. needs.
    46. We have a self replenishing source of energy, do you want to hold this area for ourselves?
    47. Special plant life would be destroyed (if dam built).

Public Workshops

Report on April 27, 1977,

U.S. Army Corps of Engineers

Dickey-Lincoln School Lakes Project

Workshop

on

Soils, Geology and Seismic Factors

Bradford A. Hall, recorder

L. Kenneth Fink, Jr., facilitator

I. Participation

In addition to workshop facilitator, recorder, and Corps of Engineers personnel the workshop involved eight participants, some with backgrounds in general geology and civil engineering, who had responded to prior workshop notices. These participants are listed in Appendix A. A workshop audience of approximately 30 people was also present and involved to some extent in the workshop discussion.

II. Workshop questions

Twelve previously prepared questions were submitted to the workshop. The questions were designed to determine if the Corps' investigations had provided certain data, deemed important for the EIS. The questions were briefly discussed and a vote taken on each as to its importance for consideration relative to the workshop theme. These questions are listed as one through twelve in Appendix B together with a tabulation of votes. Where noted in parentheses in Appendix B certain important questions were recommended for consideration by other workshops.

Questions 13 through 18 of Appendix B were generated by the workshop participants.

III. Conclusions

The considerations of questions (II. above) was followed by Corps personnel presentations related to geology, seismiclty, and dam construction. Questions posed by workshop members during the presentations, coupled with subsequent member-Corps personnel interchange, resulted in the following workshop conclusions:

1. Detailed geologic mapping (App. B, #11 & 18) related to the project area is inadequate and not sufficient for conclusions regarding the presence or absence of economic mineral deposits (App. B, #1) or the delineation of structures and rock types necessary to seismic interpretation and prediction (App. B, #5). This may also be relevant to determining critical habitats (App. B, #7).
2. Several questions (App. B, #2, 4, 14) considered the water resource and safety factors of bedrock and surficial aquifers. In summation, it was felt that, while these were important considerations, they were being adequately considered by the Corps.
3. The landscape impact of rock-fill quarrying at Gardner Mountain (App. B, #17) is an important consideration if that source is used for that purpose. The Corps is attempting to locate an alternate site.
4. The Corps' consideration of the implications of the Teton Dam failure to Dickey-Lincoln School Dam construction (App. B, #8) was considered adequate.
5. Problems of erosion, sedimentation, and slope stability (App. B, #3, 9, 16) are important and being addressed by the Corps. The workshop did not feel, however, that to date there has been sufficient study.
6. There is currently inadequate information with regard to thixotropic and liquefaction characteristics of dam site subsurface units and their relationship to dam construction and seismicity (App. B, #6). This

should be stated in the draft Environmental Impact Statement and more data presented in the final EIS.

7. The Corps should study and characterize the effects of a potential dam failure (App. B, #12).
8. Appendices C, etc., are post-workshop responses sent to the recorder.

Appendix A

Workshop Participants

Carol White, Colby College Environmental Council

Forest Dexter, University of Maine at Farmington

Donaldson Koons, Colby College, Geology Department

Mary Grow, American Association of University Women

Florence Hoar, League of Women Voters

John Peckenham, Bates College Outing Club

Glenn Natlack, Bates College Outing Club

Richard Wardwell, University of Maine at Orono, Civil Engineering Department

U.S. Army Corps of Engineers Personnel

Colonel John Chandler

Dr. Barrett

Dr. Blackey

Dr. Krinitsky

Dr. Baker

Appendix B

Questions submitted to workshop

		Important	Unimportant	Don't Know
1.	Has the Corps adequately addressed the problem of economic mineral deposits?	6	0	0
2.	In respect to site specific aquifers: 1. Has the Corps adequately identified these? 2. Assessed their impact on safety?	6	0	1
3.	Has the Corps addressed the impact of the reservoir on slope stability and erosion throughout the impoundment?	4	2	2
4.	Has the Corps adequately addressed the effects of impoundment on groundwater, including the effect of removal of surficial units used in dam construction?	1	2	4
5.	Based on the fact that the existing studies on seismicity are static in nature, will a dynamic analysis be done and is it warranted?	7	0	1
6.	What are the thixotropic characteristics of subsurface units and what effect will these characteristics have on dam structure support in the event of the maximum credible earthquake?	7	1	0
7.	What is the role of the various geologic units in determining critical habitats along the St. John River? (important question - refer to terrestrial ecosystems workshop)	-------		
8.	Will an analysis be provided of the Teton dam episode and how that event may or may not relate to Dickey-Lincoln project?	7	0	1
9.	Have erosion and scour downstream of the Lincoln School Dam been adequately considered?	6	1	0
10.	Has seismic investigation other than short term historical been investigated?	7	1	0
11.	Has there been adequate geological ground survey to back up the remote sensing analysis?	5	1	1
12.	Is the potential danger of dam failure great enough as a risk to preclude construction?	7	0	0

Appendix B (cont.)

Questions generated at workshop

		Important	Unimportant	Don't Know
13.	Is there adequate assessment of bedrock unit characteristics and their role in dam support?	5	0	1
14.	Have seepage losses in saddle area dikes been considered?	?	?	?
15.	Flood plain farmlands downstream of the proposed project owe their fertility to some degree to nutrient addition (fine-grained sediment and organic debris) during river floods. To what degree will the project affect this natural nutrient replenishment? (important for consideration in another - unspecified - session)	-------		
16.	Is sediment (suspended load and bed load) from impoundment tributaries a process that is important with regard to siltation and filling of the reservoir?	8	0	0
17.	Will rock borrow from Gardner Mountain for dam construction fill have a significant impact on the landscape? (considered important for other workshops)	7	0	0
18.	Is the publication by Boudette, Hatch, and Harwood (1976, Reconnaissance geology of the upper St. John and Allagash River Basins, Maine) adequate as a ground survey geological base?	7	1	0
	Does the mapping that produced this report support the conclusions of the authors?	6	1	1

COLBY COLLEGE
WATERVILLE, MAINE 04901

DEPARTMENT OF GEOLOGY

29th April 1977

Dr. Bradford A. Hall
Departmnet of Geology
University of Maine
Orono, ME 04473

Dear Brad:

Many thanks for asking me to participate in the 'Workshop' at the University on Wednesday; sorry that I had to leave before the conclusion, but hope that I did not miss significant comments.

There are two or three points I might make:

First, the Corps' position, which seemed to underlie and color all of their presentation, is that the project will be carried through. I detected no real question in their minds on this matter. This puts the contributing expert in an awkward position. He is expected to make professional judgements of the adequacy of a study which is to be used as a basis for decision on an undecided question. If instead the study is to be a justification of a decision already made, the judgement as to adequace is of less importance. It becomes cosmetic. My professional judgement as to the adequacy of s study my have no bearing on my opinion about the political or social necessity for the project. There has to be an opportunity to make this clear, to separate the two judgements.

Second, the seismic investigations have been made by good people, and reviewed by knowledgeable experts whose opinions I respect. Nevertheless, seismic activity in Maine does not follow the pattern of that in the West; surface expression of recent faulting associated with known seismic events is exceedingly rare. In some respects, such a study is analogous to a survey of the abandoned roadbed of the BAR south of Greenville, to estimate the liklihood of collision with a train. The evidence is elsewhere. Perhaps the best evidence would be derived from quite detailed mapping of the region within a radius of 10 miles or so of the site.

It is interesting to note that the map of linears (Appendix A of Special Report 242) shows the intersection of four linears at the site. It is the only such intersection on the map. I don't know the significance of this, but I would investigate it rather carefully before telling the public decision-makers that all geologic questions had been resolved. (I'm remided of Will Rogers' comment, that the way to find an airport was to look for the intersection of all the power lines in a region!) I'm especially concerned by this, when we learn that there is some 280-290 feet of unconsolidated material above the rock surface. Why this depth of erosion at this place? The answer may be very simple, but what is it?

My best,

UNIVERSITY OF MAINE *at Orono*

Department of Geological Sciences

110 Boardman Hall
Orono, Maine 04473
207/581-7077

May 4, 1977

Dr. Bradford A. Hall
110 Boardman Hall
Campus

Dear Brad,

As instructed by the participants in our workshop of April 27, 1977, I am submitting a minority report on the relationship of the Teton Dam experience to the proposed Dickey-Lincoln Dam project. It is my opinion that sufficient similarities exist between the two projects that a comparison of the two is warranted, if for no other reason than to inform the general public. In the educational Dickey-Lincoln filmstrip which is being circulated by the Natural Resources Council of Maine, the similarity between Dickey-Lincoln and the Teton Dam is pointedly made. I'm sure, therefore, that this question is uppermost in many peoples' minds.

From discussions with the Corps personnel present at the April 27th workshop, it is clear that no official reason has been proffered for the Teton Dam failure, despite investigations by three different groups. I would suggest a detailed comparison between the two projects, including geologic conditions, project design, construction materials, and seismicity characteristics. (The Teton Dam failure is a strong case in point for considering, not what the probability of a disaster might be, but the actual consequences when it does occur.) If this comparison is thorough, the information which is provided should be sufficient to convince the general public and the group making the final decision on the adequacy of the EIS that there is no basis for equating the disaster potential for the two projects.

Sincerely,

L. K. Fink, Jr.

L. K. Fink, Jr.

LKF:skf

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UNIVERSITY OF MAINE at Orono

College of Engineering and Science

School of Engineering Technology
122 East Annex
Orono, Maine 04473
207/581-7288

April 29, 1977

Dr. Bradford A. Hall
111 Boardman Hall
Campus

Re: Dickey-Lincoln Workshop

Dear Brad:

It was my understanding that the workshop held on April 27 was for the purpose of obtaining comments, review and questions from the local experts after they had reviewed the available materials.

I attended the meeting from its beginning to the first break period at which point I left. During this time the following occurred:

1. The Corps representatives repeatedly informed the panel that outside expert consultants were considering certain specific questions or areas of concern but their final recommendations were not completed.

2. The Corps representatives repeatedly stated that all basic data, such as boring logs, were not available.

3. The Corps representatives stated that design details were not available at the current stage of the investigation.

4. The major accomplishment of the period was the listing of questions that would be discussed in the remainder of the workshop.

On the basis of the foregoing, it was and is my opinion that a panel of local experts was assembled to review incomplete material, that was not received until a few days before the meeting, and to comment with the understanding that non-Corps expert consultants had the total expertise. The only reason to have such a workshop is to be able to have a record of such a meeting. I do not wish to be even remotely associated with such an event. Inasmuch as I signed the attendance list (as requested on entry to the room), I wish this letter to be appended to your report to register my dissociation.

Thank you for your cooperation.

Sincerely,

William R. Gorrill

William R. Gorrill
Director

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WRG/ps

UNIVERSITY OF MAINE *at Orono*

Department of Civil Engineering

103 Boardman Hall
Orono, Maine 04473
207 581-7105

May 9, 1977

U.S. Army Corps of Engineers
424 Trapelo Road
Waltham, Mass. 02154

Attn: Col. John Chandler

Gentlepersons:

In response to a request by the Corps of Engineers, the Civil Engineering Department was a participant in a workshop conducted by the Corps on the geotechnical and geologic design aspects of the proposed Dickey-Lincoln School Hydroelectric Dam Project. This workshop, conducted on April 27, 1977, started at 7:00 p.m. and, I understand it lasted past midnight. As I was unable to stay past 9:00 p.m., I do not feel qualified to be considered as a representative of this meeting.

While I was not present for the entire session, I do have some observations of the first two hours of the program that might be of interest. The meeting appeared to be a public relations effort to enhance the acceptability of the project rather than a true "working session". There appeared to be no specific responses to design questions. The participants were informed that consultants, experts in their fields, have been retained to determine a suitable design. It is realized that this meeting was set up to provide input into the Environmental Inpact Statement and that final design is still no way near completion. However, in order for the participants to provide meaningful input, design information such as boring logs, and material specifications need to be available.

In addition to this, some other criticisms of the meeting may be summarized as follows:

1. the technical information that was provided was received on the Friday prior to the meeting, not nearly enough time for concerned parties in the department to fully review it prior to the meeting.

2. the information provided, while abundant in geologic information, had very little geotechnical design data except for a several page narrative of general information.

3. the meeting was started too late in the evening for the material that needed to be covered.

Of the questions which were raised by the panel during the first portion of the meeting, there are two problems which appear to need clarification. The first deals with the cost estimates of the project, specifically what input did the geotechnical designers have into the cost figures associated with this large earthwork construction. The main concern is that the geotechnical people, who are the experts in the problems associated with the handling of soil and rock materials, have provided a meaningful input to the economists who tabulate the cost estimates for this project. As every job is different, "book values" for earthwork excavation, placement, and compaction should not be used without an estimation from the people who are familiar with their performance. Since the methods used in earthwork construction have not significantly changed within the past twenty years or more, the geotechnical group should also assure that inflation figures correctly represent the expected increased costs of this type of construction.

The second question concerns the relationship between Teton Dam and Dickey-Lincoln. While it is realized that every design is unique, it is generally accepted that the failures of Teton resulted from poor design. Becuase of the problems associated with this dam, the Bureau of Reclamation has established a policy that an independent consultant, separate from their design effort, shall be retained to review the final design of the project. The Bureau hopes to alleviate some of the problems associated with Teton Dam by having a fresh "pair of eyes" reviewing the design. Will the Corps of Engineers be establishing these same procedures for their work, and specifically the Dickey-Lincoln project?

Finally, in view of the shortcomings of the recently held workshop, the following recommendations are offered for your consideration.

1. that additional workshops be held when and if final design is authorized.

2. that these workshops be true working sessions.

3. that enough time be allowed to cover the important material.

4. that these workshops be held late enough in the design phase so that specific information is available for review but not late enough to preclude meaningful input.

5. that technical data including boring logs and specific geologic profiles be provided well in advance of such sessions to permit full review by interested parties.

DA

I would be interested in your response to the above mentioned comments and questions that have been raised. If any part of the letter is unclear please do not hesitate to call.

Respectfully,

Richard E. Wardwell

Richard E. Wardwell, P.E.
Instructor in Soil Mechanics

REW:PJO

cc: Dr. B. Hall, UMO
Workshop Recorder

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DISCUSSION SUMMARY

ENERGY UTILIZATION AND POWER ALTERNATIVES MAY 10, 1977

AUGUSTA CIVIC CENTER --- AUGUSTA, MAINE

Several Maine-based organizations were represented by discussion group participants, as follows:

Carpenters' Local #621
Kenneth Wormell, Buriness Agent

Partick McTeague
Attorney (Unaffilated)

Eastern Maine Electric Co-Op
Robert V. Clark

N. N.E. District Council of Carpenters
Nail Hapworth

Associated General Contractors of Maine
Jerry G. Haynes, Executive Director

Natural Resources Council of Maine
Wayne Cobb, Assistant Exec. Director

Mid-Coast Audubon Society

O. H. Somers

League of Women Voters

Ruth Irwin

Maine State Legislature

"Commission on Energy & Natural Resources"

Karen L. Brown

Department of Conservation (Maine)

John M. Joseph

Municipal Electric

Harland G. Titemore

Bates Outing Club

John Peckerham

After opening remarks and introductions by Discussion Leader Dick Davis, a status report and timetable for the EIS was presented by Colonel John Chandler of the Corp. The entire discussion period was then devoted to the generation of questions and the delivery of subsequent responses by Corp personnel and contractor representatives. The principal participant representing the latter used John Lawrence of Acres American.

Rather than enumerate the questions and then all the responses as a direct record of the proceedings, this recorder feels that the most informative exposition would be to indicate the responses following each question to maintain a more logical sequence. Thus this record is not a precise chronological rendering of the discussion, but will include all the salient points.

Question #1

Have local utility companies been omitted from the distribution analysis, and if so, why?

Answer #1

Actually a power marketing question and should be addressed at the Workshop dealing with this subject. Further discussion revealed social and economic implications which should be addressed at the upcoming workshop dealing with those subjects.

Question #2

Has the load requirement been broken down adequately for local use within the economic transmission range?

Answer #2

A power marketing question to be addressed at appropriate workshop.

Question #3

Have potential demand control measures been given adequate attention?

Answer #3

Yes, per John Lawrence deductions used in the computations are "possibles" not "probables".

At this juncture a lengthy presentation was made regarding load management and convservation measures, with an explanation why conservation was not considered an alternative power source. An enumeration of the 24 initially considered alternatives was presented followed by an investigation into the viability of the 6 principal alternative suggestions. The final four, namely:

Thermal

Gas Turbines

Nuclear

Combined cycle

were discussed in detail, based on the presumption that 5-7% more power will be required per year and that "there is no realistic no-growth scenario" (Col. Chandler)

Question #4

What constraints have been placed by the Corp on the consultants in the examination of all possible alternatives?

Answer #4

None. Budget and instructions were adequate and the limitation was the requirement that New England be.

examined as a whole rather than smaller areas.

Question #5

What percent of the power output will go to Maine and New England? What percent of total energy utilization will be represented by the facility's output?

Answer #5

Distinctly a marketing question to be addressed at the appropriate workshop. Consultants shared the following:

Postulated output:

44% of the energy to Maine

22% of the capacity to Maine.

Question #6

What percent of Maine's timber resource, assuming uniform management will be lost? To Whom?

Answer #6

Should be discussed at Terrestrial Ecosystems Workshop.

Question #7

If new areas for investigation are uncovered, or methodical problems are discovered in the contractors' work, how much money is available to repair inadequacies of method or substance? Or to explore additional areas?

Answer #7

Difficult to answer. The fiscal year 1978 budget is currently in the process of being "marked Up". An attempt will be made to do whatever is required, and "funding will not be a problem in terms of creating a quality Environmental Impact Statement ..." (Col. Chandler)

Question #8

Has the cost of transmission been adequately examined, both in terms of dollars and energy efficiency?

Answer #8

Transmission costs have been derived from published data. The contractor is unfamiliar with the methodology utilized to determine those costs. The 135 mile Western corridor ties into the N.E. POOL Grid.

Question #9

If the project is not built, will business enterprises in Maine and New Hampshire be too dependent on imported Canadian power?

Answer #9

Canadian contracts are in force throughout 1980, covering a relatively small amount of power. No measurement has been made of "out of area" consumption.

Question #10

Was wood-fired power generation given adequate consideration? If not, why not?

Answer #10

Was given adequate consideration and discounted; no evidence exists that such an alternative is competitive. Besides, wood would satisfy a base load need, whereas the project in question is designed for peak load needs.

Question #11

Was waste given adequate consideration as an alternative?

Answer #11

The same response applies as to question #10

Question #12

Is the data dated? (If all assumptions are based on Oct., 1975 figures are all facts based on that instant in time?)

Question #13

Has the study kept current with the "state of the art" of energy alternatives?

Question #14

Have energy conservation measures been ruled out, and new approaches such as peak load management and home insulation.

Answers to #12, 13, 14

All data is sufficiently current, and all logical power generating alternatives have been thoroughly investigated.

Question #15

Has consideration been given to possible changes in climatic conditions?

Answer #15

The 41 year available record confirms the validity of the plan.

Question #16

Has consideration been given to potential public power with priority demands that would deprive the private sector of the project's output?

Answer #16

A power marketing question, deferred to the appropriate workshop.

Question #17

Is Dickey Lincoln the only sensible answer?

Answer #17

No, but all others would be more expensive.

Question #18

Has consideration been given to pump storage plans in New England?

Answer #18

Yes

There followed an informative presentation of output and power allocations, to be discussed in more detail at the appropriate workshop.

The recorder recommends that copies of this summary be circulated to all workshop participants, and that copies be sent to the facilitators and recorders of workshops to which many of the above questions were deferred with the requirement that those questions be allocated priority positions on their agenda. Further, it is recommended that the record of those workshops be circulated to all participants in this workshop for their edification.

Dickey-Lincoln School Dams
Terrestial Ecosystems
Workshop Summary

Richard S. Davis
Recorder

The workshop was called into session at 7:00 p.m. on May 10 by the moderator, John Christie of Ad Media, and continued until 12:00 p.m. In attendance were: Dr. A. E. Brower of The Garden Club Federation of Maine and Augusta Garden Club; C. Edwin Meadows, Jr. of Seven Islands Land Company; Dr. Anthony Filauro, Great Northern Paper Company; John Joseph, Conservation Committee, State Legislature; O. H. Somers, Midcoast Audobon Society; Sally Surgenor, Appalachian Mountain Club; Mary Grow, American Association of University Women; Mazel Percival, League of Women Voters; and Janis Speel, Maine State Legislature. Also in attendance were Colonel John Chandler of the U. S. Corps of Engineers, representatives of his staff, Dr. John Mathies of Environmental Research and Technology, representatives of his staff, and Dr. Richard Davis of the College of the Atlantic, serving as recorder.

Following a brief discussion of the Environmental Impact Statement by Colonel Chandler, Mr. Christie solicited questions from the participants in a counter-clockwise rotation. Development of questions was followed by an intermission and, subsequently, a question-by-question response from the Corps personnel and contractors. These questions, listed by author, and responses are appended below.

In general, it may be said that there were three broad areas in which the participants found inadequacies: impact upon lumbering operations as dependent upon terrestrial ecosystems, impact upon species other than mammals, and elements of methodology. Of particular concern to the lumber companies were issues which involved economic impacts and such "secondary" effects as a potential spruce budworm hazard in over-mature timber isolated by impoundment, effect of construction impact on the latitude allowed for lumbering operations by present D.E.P. and E.P.A. regulation (i.e. would construction impact be too great to allow for concurrent lumbering), and impact of displaced organisms on neighboring ecosystems?

Discussion of non-mammalian species revealed that no significant consideration had been given to impact upon reptiles, insects, birds, and flora other than a few endangered species. Dr. Brower was particularly critical of the fact that no attention had been given to general evaluation of impact upon the more common species of the area and to determining the biological and aesthetic uniqueness of the area (which he believed to be unmatched). These concerns were echoed by others together with concern for the management of bordering systems and the recoverability of biomass and rescue of organisms from the impounded area.

Methodological discussions revealed the need for more ground-truth surveying as opposed to literature review. Disagreements were voiced with the bases for costing timber resource and wildlife loss, applicability of data based upon analogue comparisons, and the factuality of certain informational claims.

The details of these issues are included below together with indication as to whether the contractors' and Corps' replies were deemed adequate. In the interest of brevity, the replies have been included in detail only where the material covered goes beyond a mere reiteration of the Environmental Impact Statement.

Question and Replies

Author: E. Meadows

1. What will be the impact on the structure of local and regional commercial forestry and the neighboring forests themselves? Where will this situation be addressed?

   Reply: This material will be covered in the social and economic impact sections of the E.I.S. Analysis of forest structure was reiterated with recognition that since 2% of Aroostook forest was involved, pressure to meet demand would be increased on neighboring forests. Participants expressed concern that this be considered and also expressed disagreement that the mandated cost benefit basis did not provide for loss of forest revenues in perpetuity.

2. To what extent were reports based upon literature survey rather than on-site or ground-truthing surveys?

   Reply: After detailed explanation and discussion of methods, the contractor agreed that more on-site studies were in order though he expected his initial conclusions to be confirmed. He further indicated that he would welcome the opportunity to pursue such studies, including attention to unexamined species should funds be forthcoming for the purpose.

3. What contraints were imposed upon the contractor by the Corps, both with regard to methodology and areas considered within the scope of the study?

   Reply: None. (Answer satisfactory to participants.)

4. What effect will construction activities have on aquatic systems?

   Reply: Siltation not dealt with here but would be covered under appropriate section. General interest was expressed in a workshop on aquatic systems.

5. What effect would the construction impact on aquatic systems have on water quality regulation as affecting timbering operations, both during and after filling? What harvesting for the reservoir compete with quotas upon harvesting elsewhere in the area and regulation of impact from the latter for roads, etc.? When would this be addressed?

   Reply: Timber company operators are specifically exempted by legislation from competition in this fashion. Concern was voiced that this did not answer the question of actual damage due to combined operations, assuming that existing regulations were based upon significant limits.

6. What would be the impact of reservoir clearing on the forest itself, to mills confronted with a glut of competing timber, labor supply, economic systems, in terms specific to individual mills, communities, and sub-regions?

   Reply: Edward C. Jordan Company is considering the economic dimension and would look at labor, stumpage, and the impact of glut.

Not much would be done to such related impacts as individual sawmill supply and output. Concern was expressed by the timber companies that such analysis should be carried to further detail.

7. What will be the cost and impacts of displacing wildlife management and mitigation unto neighboring forest areas? Will this be addressed?

Reply: U. S. Fish and Wildlife will prepare estimate of requirements for mitigation and stating the needs which would be met by the Corps. It was pointed out that since neighboring yards were at maximum population support and efficiency, management could not be employed to enhance carrying capacity and bio-mass. The contractor acknowledged this point and suggested that compensation might have to be paid instead. Considerable dissatisfaction was expressed upon this point, including questions as to whom and in what sense compensation could be paid.

8. What provisions would be made for the rescue of animals from temporary islands during filling?

Reply: Such provision would be made, though the contractor disapproved it as a false kindness to organisms that would perish anyway in competition on the fully populated neighboring areas. (Reply acceptable to participants.)

9. Has the value of the forest products and lands been included in the cost/benefit ratio? What values were used for land value and for volume productivity of wood?

Reply: Yes. (With detail satisfactory to participants.)

10. Has an incorrect assumption been made to the effect that intensive management would not be practiced by commercial woods companies?

Reply: This point was debated, with contractor arguing that intensive management was not applicable to Maine while the timber companies argued that intensive management was being defined in terms of deep Southern silvaculture. To the contrary, they claimed, there are various intermediate levels of management which are beginning to be practiced in Maine and which would change yield projections.

11. What will be the management plan for the forest"island" created on the Canadian side? What will be the impact upon efforts to bring that wood to American markets including issues of transportation, economics, social impact, labor market, etc.?

Reply: It was explained that land settlement would include provision for access bridges and causeways or payment of compensation adequate to provide for such construction. Ed Meadows pointed out that this whole area needed further consideration as he doubted that such issues as capital gains tax losses to land owners would have been considered by the economic impact section of the E.I.S. All parties agreed that discussions would have to be held in this area.

Author: Anthony Filauro

12. Why is the 206,000 acre "island" not brought into the study area? Will it become a breeding area for spruce budworm due to non-harvesting?

Reply: Questions of ecosystem impact have been covered already, the issue of budworm is moot in that provision would be made for harvesting.

13. Page 139 cites figures for cordage which should be 1.8 million cords, what is the origin of figures used?

Reply: Corps used the same source as Filauro but has corrected specific acreage to 76,100+ acres. Filauro indicated that this would be agreeable provided that subsequent examination indicated the same conclusion.

14. Why is there a discrepancy in the acreage figures used on page 139 and those used elsewhere?

Reply: This question was covered in the reply to the preceding question.

15. What will be the downstream effect of nutrients washing out from the impoundment area?

Reply: This issue is being dealt with in the section on water quality. Interest was expressed in a workshop on this section.

16. What is the value of the timber and potential timber to the state of Maine, as opposed to the landowners? Is the figure used stumpage value or some other basis (since estimates indicate that the economic value of a cord of wood to the State is about $200.)?

Reply: Value estimates were based upon stumpage value of growing stock plus net growth during project. Discussion of multiplier effects and related issues deferred to economic and social impact workshops.

Author: John Joseph

17. Contrary to past usage by Canadian operations, timber in this area has begun to be given American development. Has this change been given consideration?

Reply: See above discussions of access compensation.

Author: A. E. Brower

18. Why wasn't more emphasis placed upon flora and such biological features as insects? Why was more attention not given to study of the impacts upon common, as well as rare, species?

Reply: It was agreed that this is a basic weakness in the E.I.S. which needs further work.

19. Has adequate attention been given to edge species? Given the critical life-cycle role, fragility, and slow re-establishment of edge species,

how did the contractor reach the conclusion that edge life would benefit and be increased?

Reply: The reference on page 100 does not use 'edge species' in the usual sense to refer to the ecotome between two habitats. Here edge is used to refer only to the edge of the impoundment which would be larger than the St. John's waterline and thus afford greater potential living space. It was conceded that edge species would be damaged and would be slow to recover. It was also conceded that more analysis was needed here.

20. It was claimed that this was one of the most unique ecosystems in North America for the species-complexes and habitat which it offers. Has anything been done to evaluate the St. John's basin for uniqueness as an ecosystem?

Reply: There are no plans to look at this area in terms of system uniqueness. However, it has been proposed for protection under the Wild and Scenic Rivers Act. Participants wished to see this pursued further.

Author: Mazel Percival

21. What are the implications of the project for birds and insects?

Reply: See above.

22. What will be done to repair damage of removing the 60 million yd^3 of rip rap?

Reply: Present plans are to remove rip rap from the impoundment area. Should changes have to be made in these plans, restoration would be carried out by the Corps. (Participants seemed satisfied.)

Author: Mary Grow

23. In estimating populations of birds and animals, what is the range of probable error in the methods employed?

Reply: The Fish and Wildlife departments (state and federal) supplied figures with estimates being based upon long research and using high, low, and medium projections of error. These departments are also evaluating reliability of the general habitat study using highly developed systems checked out at 90% $\pm$ 10 for uplands and 80% $\pm$ 20 for wetlands.

24. What allowance was made for the effect of the ecologist on the system while under study?

Reply: Conclusions in this area were based largely on literature, photos, and assumptions as to the behavior of animals and populations in certain habitat. Work on avifauna was not analyzed and was drawn from literature. Again the belief was expressed by participants that more on-site work was needed, particularly to determine accuracy and appropriateness to this locale of comparative methods employed.

25. What has been done to consider reptiles and fishes in the impact study?

Reply: See above and refer to aquatic systems.

Author: Joseph Lupsha

26. Has adequate review been given to Canadian scientific studies in relevant areas?

Reply: It was agreed that Canadian literature on habitat analogues could profitably be examined. The use of this material was limited by access and fiscal restraints. However, it is doubtful that the effect of would be substantive. (Participants seemed satisfied.)

27. Have these documents been circulated "out-of-house" for scientific review?

Reply: The draft is currently under review by fish and wildlife agencies at the state and local level. Other individuals, including the participants, were scrutinizing it. (Participants seemed satisfied.)

28. Has adequate treatment been given to any beneficial ecosystem impacts?

Reply: There do not seem to be any beneficial effects for terrestrial ecosystems. Some benefit will accrue to avifauna, particularly waterfowl. Some benefit may accrue to aquatic organisms. (Participants seemed satisfied.)

29. With respect to rare species, are those which do not explicitly mention a Canadian habitat found exclusively in the St. John's basin?

Reply: No. (Participants seemed satisfied.)

30. What is the reaction of the state and federal wildlife services to this report?

Reply: The reports are currently being studied and thus have not afforded a response.

Author: Sally Surgenor

31. What is the estimate of the life of the project and the gross loss of sustained yield?

Reply: Life is estimated at 100 years, as to yield see above. (Participants seemed satisfied.)

32. (injection by Lupsha). Is the research data on nutrients sufficiently applicable to this area? Has data been drawn from the W-6 area which was treated with herbicides for three years?

Reply: Yes to both questions. After debate over appropriateness, the parties seemed agreed that this was an appropriate base of comparison for a submerged area.

33. How much timber and general biomass would be removable and what would be the limiting factors?

Reply: There is no completed estimate yet as to extent of clear-cutting. It would probably extend one mile back from the dam and in shallow areas. However, some shore growth would be left for water-fowl cover and extensive bottom cover. Here the decision would be based upon the best biological reasoning available. (Participants seemed satisfied.)

34. Could a better description be given of the Seven Islands management relationship?

Reply: This question became lost in the general discussion of an earlier issue and due to the fact that the janitor had appeared to notify us that he was going to lock the building in fifteen minutes.

35. What is the <u>actual</u> life of the project given the figures on page 139? Have costs been figured for 100 years of impoundment plus 80 years of regeneration?

Reply: Yes, calculations have been projected for the entire period. (Challenge was offered by Filauro and Meadows, who indicated that a mature forest could not be achieved in that time.) Contractor stressed that the report claimed only that a harvestable uneven aged growth could be achieved in that time frame. Meadows concurred that some harvestable trees might be produced though the debate remains open on quantity and commercial significance.

Two questions were raised by the audience but were redundant with earlier questions and resolved during discussion. The workshop closed and adjourned at 12 midnight.

WORKSHOP REPORT

Construction Impacts on Local Communities of the Dickey-Lincoln Project

Ft. Kent, Maine

May 17, 1977

submitted by

Sharon Graves Floyd, Recorder

Five areas of concern emerged in the course of discussion on the labor impacts of the construction of the Dickey-Lincoln School Lakes project. Broadly defined, they are as follows: 1) contract management, 2) labor services and opportunities, 3) secondary employment, 4) governmental services and relationships, 5) transportation, and 6) construction phasedown.

Contract Management

Described as sequential and task-related in nature, the process of contract management on the part of the Corps needs to be better defined for purposes of public understanding.

The nature and number of contractors and subcontractors involved produce variables that need to be better assessed by E. C. Jordon or another consulting firm. Some pertinent questions that need to be examined are:

a. To what degree does the number of contractors affect the permanence or turnover of the workforce? It was suggested by participants that a general contractor or small number of contractors would reduce labor turnover, thereby affecting housing decisions, social services, and local employment opportunities in a way different than the impact of multiple numbers of contractors present in the area for more abbreviated periods of time.

b. What opportunities would Maine companies have to bid for contracts on the project? One individual, associated with a construction firm, felt that Maine contractors would go to larger, out-of-state firms, a situation that would, it was suggested, favor out-of-state labor, enlarge the role of unions, and affect commuter and residency patterns.

Labor Sources and Opportunities

It was generally felt that employment opportunities for residents of Northern Aroostook County would be limited primarily to jobs requiring few skills. Since there may be public misperception about employment opportunities associated with the project, this probable condition should be spelled out by the Corps.

As mentioned in the discussion under "Contract Management", the availability of jobs for local and Maine residents will be affected by the nature of contractors on a job and union agreements they may have. With a relatively low degree of unionization in Maine, it is not clear what opportunities skilled but non-unionized Maine labor will have for employment on the project.

A public policy decision on the part of appropriate State authorities should be made as to whether or not the provision of training programs in skilled occupations would increase the competitiveness of Maine labor for construction jobs, a discussion that needs to be made in light of the lengthy work experience required of some occupations and of the short term nature of the Dickey-Lincoln project.

No assessment of labor needs for clearing the impoundment area has been done. Is it proper to assume that companies such as Great Northern and Seven Islands would shift their labor forces to that area in lieu of other sites?

Secondary Employment

Although the Jordon report indicated that secondary jobs will be created in the service and non-durable goods categories, little calculation of the characteristics of that employment has been done.

No clear projections or comparable data have been provided for what the employment characteristics of the northern County region would be in the absence of the project. Particularly noted was the lack of any references to the lost opportunities for woodlands employment in an area, some argued, that is undergoing increasing scrutiny for its potential in wood production.

Though the effects of wage differentials and inflationary tendencies of the project on the local economy were outlined in the contractors studies, the Corps will need to underscore their effects to assure public understanding.

Governmental Services and Relationships

Considerable discussion on the impact of the proposed project on governmental, especially municipal, services entered this session and one later devoted to social impacts.

The lack of a definitive statement on the location and characteristics of housing for labor on the part of the Corps and the absence of careful delineations of options on the part of E. C. Jordon, leads to superficial assessment of the impact of construction would have on municipal services, a problem further underscored in discussions of social impacts. Needed is an examination of housing alterantives and a thorough assessment of resultant impacts.

Multiple questions exist about the relationships, authority, and responsibility of various government units. To what degree has the Corps been in contact with State authorities? What Federal assistance will be

available to communities to plan for and respond to the strain on municipal services occasioned by the presence of a large and temporary workforce? Will financing of expanded services be accomplished through Federal subsidies or will municipalities have to adjust tax rates?

A notable absence in the contractors report is any reference to the effects construction might have on Canadian labor, economy, and relations, an absence evidently the result of a Corps decision.

Transportation

The influx of laborers to the northern Maine region will put additional stress on road and traffic systems, ones in some instances deemed currently inadequate. Who will bear the responsibility of upgrading facilities? How will improvements affect labor commuter patterns?

Construction Phasedown

The completion of the construction phase of the Dickey-Lincoln project may creat new economic disruption or magnify problems already existent. The problem of absorption of local labor back into a diminished economy, the problem of excess capacity in services and facilities, and the possible acceleration of outmigration patterns, to name a few, need to be more closely scrutinized and mitigation procedures more fully delineated.

1. To what extent will the construction of the Dickey-Lincoln project create secondary jobs?

2. How does the Corps of Army Engineers intend to manage contractors?
   - will there be contract opportunities for small local contractors?

3. How will municipal services be affected by the project?
   - Does the Federal government intend to subsidize municipalities for the needed expansion of services or will the communities involved have to raise taxes to cover additional costs?
   - What governmental unit will have the responsibility and authority should workers locate in unorganized territories?

4. What are the short and long term labor needs?
   - Have estimates and the source of labor been included in the construction and/or economic impact studies?
   - How will the wage rates offered at the construction site affect other employers?

5. What happens during the phasing down and completion of the construction?

6. Where will the workforce come from?
   - What kind of labor skills will be needed on the project?
   - Can the problem of labor turnover be reduced by hiring more Maine people?
   - What training opportunities will exist? Will the Vocational Technical Institutes be affected?

7. How will unionization affect local workers?

8. How will the housing needs for the labor force be provided?

9. How will the construction of the project affect the transportation and communication systems of the region?
   - Will provisions be made for road improvement to handle the increased traffic?
   - Has there been a study of commuter patterns for the project?
   - How will rail service be affected?

10. Has there been any assessment on the role of state regulation on the construction of the project?

11. What are the cultural impacts of the project on the region?

12. What impact will the project have on Canada?

DICKEY-LINCOLN SCHOOL LAKES WORKSHOPS

Tuesday, 17 May 1977

2:00 p.m. Fort Kent

ECONOMIC IMPACTS

This session had the greatest attendance of the four held in Aroostook County, with as many as twelve people voting on the relative importance of the questions.

Participants seemed to be fairly well prepared and had no trouble formulating twenty-six questions for consideration.

Those questions in which the participants showed relatively little interest included:

#5. What values were used in assessing the paper industry in Aroostook County

#9. County per capita income

#12. Values added to area economy through local purchase of supplies

#15. Unique ownership structure of the land

This reporter suspects that the vote totals indicate that the people present considered these topics to be either relatively unimportant and/or adequately handled in the materials provided.

Discussion of individual questions proceeded based on the relative importance assigned in the balloting.

#13. Has there been an inventory compiled to estimate gains and losses of resources?

This question generated some rather intense debate between Corps personnel and representatives of Seven Islands Land Company about the

adequacy of the method of evaluating the existing forest. While much of the debate seemed technical, a vague Mr. Sinclair did indicate that an adequate inventory in his opinion would include knowing what constitutes each stem.

The Corps should review the level of confidence of their present inventory and the methodology for adequacy.

#19. What would be the tax loss to the State and what would be the additional costs to the State?

The direct response to the question was that there would be no tax loss, because the remaining land would be taxed at a higher rate. In follow up it was indicated that the effect of this tax increase on woods operations had not been computed.

#8. What is the long range effect of the removal of this acreage?

There was a technical debate on the appropriate value for opportunity costs and an indication of a need to justify the rate used (10%).

#7. Reallocation of resource possibilities.

The use of 100% reallocation of resources during the clearing and construction of the dam was discussed at some length. There seemed to be agreement that the rate possible was an unknown.

#4. Area isolated from the rest of Maine by the impoundment.

This discussion was also marked by uncertainty particularly whether or not it would in fact be isolated or connected by bridges and causeways.

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The following points were included as needs to be presented to the Corps for their consideration in developing an EIS acceptable to the participants.

1. Need a better inventory of what is on the ground at present.
2. Need an analysis of the trends in forest product use between the U.S. and Canada.
3. Value of product should consider product research, actual use, etc.
4. Need justification of the 10% discount rate and cost benefit analysis.
5. Need analysis of who accrues costs and benefits--Maine, New England and Canada.
6. Consider the validity of 100% reallocation of resources.
7. Cost of removal of non-merchantable wood was not considered--should at least be added for area between 913 and 875.
8. Cost of isolation should be quantified. Means of access should be studied.
9. Need to look at trends of demand for fiber (may be in full study).
10. What other developments might result from the existence of the dam; if there are none the report should say so.
11. Specify number of job opportunities lost to forest industry by dam construction.
12. Finally, there was agreement that the production rates used were acceptable.

WORKSHOP REPORT

Social Impacts of the
Dickey-Lincoln Project

Ft. Kent, Maine

May 17, 1977

submitted by

Sharon Graves Floyd, Recorder

Social Impacts

The discussion of the social impacts of construction of the Dickey-Lincoln project on local communities was characterized by participant weariness, redundancy of issues raised in earlier sessions, and by general unspecificity. The report on social impacts by E. C. Jordon was uneven in its thoroughness and documentation, with frequent references made to unpublished materials and conclusions.

Considerable concern on the part of municipal officials was voiced on just how their respective communities would be affected. As noted in the review of the workshop on construction impacts, the absence of concrete decisions on the type, location, and financing of housing for workers make for a disorderly and superficial assessment on social repercussions within specific communities. A charting of alternative housing solutions with concomitant effects, quantified where possible, would give a more pragmatic picture of social impacts. Included in a report should be an approximation of additional costs that may be passed on to communities in the framework of given alternatives.

Without a clear picture and differentiation of community specific impacts, descriptions of mitigation efforts is necessarily vague. Municipal officials attending the workshop expressed considerable concern about how to plan for their communities in light of such uncertainties. A cataloguing of federal, state and municipal resources and responsibilities, and the delineation of a planning process would help in the assessment of alternatives.

The E. C. Jordon report emphasizes the French speaking culture of the area. Little reference is made to the impact of the project on relocated towns. One in particular, Allagash, is an English-Irish community in a French dominated region, its families representing generations of settlement and its economy dependant to an unusually large degree on woods related activities. A letter from Edith Kelley of Allagash is attached.

Questions

1. What housing provisions will be made for laborers and their families?

2. How will the project affect municipal services?
   - Who will pay the cost of expanded services?
   - What services would be provided by federal or state agencies?

3. What will be the effects of the influx on large numbers of male workers on the area? How will behavior problems be mitigated?

4. How will the construction of the project affect the social, religious and culture characteristics of the region.

5. What assessment has been done on the impact of relocation of towns in the impoundment area?

Allagash, Maine
May 23, 1977

Ms. Sharon Floyd
Development Office
Husson College
Bangor, Maine 04401

Dear Ms. Floyd:

I attended the work shop May 18, conducted by the U. S. Army Corps of Engineers concerning the Cultural-Historic Values of the Dickey-Lincoln area.

I had not read the archaeological and historic report prior to the meeting, therefore, could not comment on the report at the meeting. At that meeting you mentioned that I could write you concerning the EIS.

The Seven Islands is one of the beauty spots of the St. John River and I love to visit there. After attending the meeting Wednesday in Presque Isle, I came home, read the report and then played a tape recording of my mother describing the Seven Islands. Her mother worked there for five years. She went to work there when she was about sixteen years old. My mother names the three other girls that worked there and said a Mr. and Mrs. Corbett were the caretakers. Mrs. Corbett paid my grandmother and also gave her bolts of material for dresses. The EIS statement on Seven Islands being a settlement or community is a distortion of history. I have a copy of a letter from a grandaughter of Mr. Cary, the first lumberman to establish a depot at Seven Islands. She states that the Portland Historical Society has documentation of Mr. Cary and the Seven Islands. The Seven Islands farm was one of many such farms on the Allagash and St. John Rivers, however, Seven Islands was the largest. Seven Islands was strictly a business, serving as a depot to supply many lumber operations going on at the time. After Shepherd Cary, the business went to Kilburn and McIntosh and on down through to an individual lumberman or a lumber company until abandoned. The settlements of Dickey and Allagash were settlements that dates back as far as the Seven Islands, richer in historical data since they were communities. The settlements of Dickey and Allagash combined into on town and since 1830 the occupation of its inhabitants have not changed, they are strictly lumbermen.

I have been taking notes on Allagash History for over thirty years, organized the Allagash Historical Society and am dedicated to facts. I believe that the Seven Islands is a very important part of Allagas history in relationship to lumbering, but not as a community. There

are many men here that are very familiar with the lumber operations carried on at the Seven Islands, as well as the Michaud Farm and Cunliff Depot on the Allagash.

I believe that the Environmental Impact Statement should mention something about the history of the people of Allagash. A study should be made as to what impact the dam will have on the poeple that live in the area. The psychological effect of being uprooted and the change that will be made in their life-style. Where will they lumber? Will they be located near rivers and lakes? They do not want to live below the dam and object to having the school below the dam. The people have lived for many yea with the possibility that their homes might be flooded and have a lot of questions that can not be answered. The town of Allagash is made up of four townships - will they be alloted the same acerage? There are many questions, but I think that you will agree that the Environmental Impact Statement skirts around the people and very little has been written about them.

Sincerely,

Edith Kelley

EDITH KELLEY

cc: Mrs. Porter

DICKEY-LINCOLN SCHOOL LAKES WORKSHOPS

Wednesday, 18 May 1977

2:00 p.m. Presque Isle

CULTURAL-HISTORIC VALUES

This workshop was rather sparsely attended and was conducted informally. Only seven questions were formulated.

1. Is there any evidence of habitation immediately after the glacier retreated?

The answer from the consultant was no; however, there was some discussion as to whether the techniques used would have indicated such habitation.

2. Is there evidence of habitation between 200 BC and 1600 AD?

Again the answer was no, and the techniques debate was pursued somewhat further.

3. What evidence is there of activity during the lumbering era?

There seemed to be agreement that this period was adequately covered.

4. The St. John River has migrated over the years. Were the old beds investigated?

The answer was a longer version of yes and seemed to be adequate.

5. It was pointed out that there is an Indian grave yard where the Allagash enters the St. John.

The consultant was not aware of that and indicated he would look into it.

6. Were the buildings in Allagash evaluated?

The answer was no.

7. Are there any indications of French traffic in the area?

The consultant indicated he has found no evidence of it.

There was also some debate about the relative importance of the sites that have been located. It was indicated by the consultant that without the possibility of the dams being constructed they would not be investigated immediately. However, he continued to say that given the resources available it was only possible to investigate those sites that were under either natural or developmental threat of being lost.

Overall there appeared to be agreement that this was a well-prepared and documented report.

Proceedings of the Dickey-Lincoln School Lakes Workshop

Subject: Project Economics and Power Marketing

Date: May 24, 1977

Location: Augusta, Maine

Moderator: Charles O'Leary Recorder: L. Kenneth Fink, Jr.

This workshop was conducted for the purpose of obtaining an input from Maine organizations to the technical review of the scope and content of the Dickey-Lincoln project studies which are directed toward determining the environmental impact of the project. The topics of this workshop were project economics and power marketing.

The participants in this workshop included invited panelists, Corps of Engineers personnel, and individuals with the responsibility for preparing the technical documents for these workshop subjects.

The panelists in this workshop and the affiliation of each are as follows:

Robert V. Clark
Eastern Maine Electrical Corp.

A. Myrick Freeman
Dept. of Economics-Bowdoin College

Mary Grow
Maine Chapt., American Association of University Women

James C. Hansen
Municipal Association of Vermont

Lee Rogers
Staff Attorney, Natural Resources Council of Maine

O. Herbert Somers
Mid-Coast Audubon Society

Kenneth E. Starrett
Warren, Maine 04864

Harland G. Titemore
Municipal Association of Vermont

The Corps of Engineers personnel were:

Col. John Chandler, New England Division
Mr. Richard Riordan, New England Division
Dr. Bud Barrett, New England Division
Mr. Larry Grossman, New England Division

The Contractors, for these sections of the EIS, who participated in the workshop were: Mr. Martin Thorpe, Federal Power Commission
Mr. Harold Wright, SEPA
Mr. Steven Parker, Corps of Engineers
Mr. Steven Rubin, Corps of Engineers

After introductory remarks by Mr. Charles O'Leary and Mr. Reardon, the first portion of the workshop was directed toward developing questions about specific items in the information packet and study results which were sent to the workshop participants prior to the meeting. The twenty-one questions, which were developed, are listed in Appendix A. In a review of the questions during a break in the workshop, it was clear that the questions could be divided into five general concerns. These are as follows:

1. Flooding of Timberland
2. Power Benefits
3. Project Constructions
4. Specifics of Calculations
5. Project Financing

After the questions were formulated, the Corps' contractors then responded to the questions more or less in numerical order. The answers gave rise to further questions and, from the ensuing discussions, the workshop participants were able to separate those questions which sought more information or a clarification from those which identified valid concerns and adequacies of the studies. In several instances conceptual differences in approaching the benefit/cost study and power marketing considerations became apparent. The following summary comments represent the gist of these discussions.

It was generally agreed that a clarification is in order to determine just how equal the specific considerations are which appear under both the benefit and cost sides for several project economic calculations. For

example, the participants concluded that there might be a decided asymmetry in considering redevelopment benefits against the question of job losses.

Doubt was expressed about the basis for determining some of the future benefits and costs of the project. Questions were posed about the adequacies of real future costs of oil as well as whether the Corps has fully considered the power benefits to small utilities in the future when there will be a need for both peak load and load factor power. The year identified for this additional power was 1986. It was generally concluded that as much detail as possible should be included when describing how future costs and benefits are figured and that a thorough justification of the methodology adopted should be presented.

In discussions of the specific methodology used in figuring benefit-cost ratios, the workshop participants agreed that there were two conceptually different approaches. One approach, used in the existing study, is carried out according to very specific rules drafted by Congress for Water Resource Projects. The actual calculations which are to be included in the analysis are based on these rules which are narrow in concept and technically defined. The second approach is broader and addresses real problems which may not be included in the more carefully defined approach. The particular problems which were thought to be the result of the narrower approach are a) the inadequacy of the considerations for mitigation of adverse impacts, b) the inadequacy of using a regional approach to price and income trends and c) the inadequacy of the considerations of the future demand for wood fiber (i.e., is the true future value of the timber lost due to the project accurate?). One additional conceptual omission which was discussed was concerned with economic opportunities which might be forgone in pursuing water resource projects, which are short term labor intensive developments,

in lieu of continuing the present use of the area. Several of these points are discussed in more detail in the correspondence (see Appendix B) from individuals who participated in the workshop.

There were several questions about the inadequacies of the labor market to fulfill the project needs. It was concluded that additional clarification is necessary to specify how laborers from Aroostook County will be accommodated in the union labor pool. In addition, information from various labor considerations should be included in the section on project economics.

The workshop participants instructed the recorder to note that the details of the cost estimates were not analyzed in this workshop.

Because of time limitations, several technical discussions proposed by workshop participants had to be curtailed. The individuals were requested to submit their comments for inclusion in this report. There were three letters submitted in response to this request and they are found in Appendix B. The respondents and their subjects are as follows:

Dr. A. Myrick Freeman, III -- Criticism of Benefit-Cost Methodology Used by Dickey-Lincoln Project
Mr. Edward Lee Rogers -- Criticism of Benefit-Cost Analyses
Mr. James C. Hansen -- Comments on Proposed Marketing Plan for Dickey-Lincoln Power

Appendix A -- Questions Developed in Workshop.

1. Is the assumption of a privately financed alternative power facility valid?

2. Why isn't the lost timber figure obvious in cost calculations?
   a) Of the total state timber production, what percentage will be lost due to the Dickey-Lincoln Dam project?

3. Referring to Table I, page 20 :
   a) What is the basis for the estimate?
   b) What role is played by the interest rates?

4. What is the current cost for long-term federal money?
   a) How firm is the 3-1/4% interest rate in figuring the benefit/cost ratio?
   b) Why should 6-3/8% be used?

5. Has the increasing cost of oil in the future been properly considered against the expense of producing power by means of falling water?

6. Have the jobs, which would be lost as a result of the project, been considered and properly accounted for in determining redevelopment benefits? Referring to Tables I and III in the redevelopment analysis, are the figures used in those tables the same as those appearing in the E.C. Jordan report? If they are not, what is their source?

7. Was the analysis of the Aroostook County job market adequate?
   a) In the event that relocations of the labor force occur, will there be a cost, which has not been figured in yet, for new living quarters?
   b) If the labor force commutes, has cost of road maintenance been considered?

8. Have the amounts figured for roads changed; if so, what is new amount?

9. What is the present status of the treaty with Canada?

10. Has the full beneficial impact on small utilities who utilize high load factor energy been properly considered?

11. How was the 100-year flood zone determined? Was it used in all calculations except those related to Ft. Kent?

12. Were nutrient benefits to croplands below dams considered in figuring benefit-cost ratios?
    a) Were the benefits of water being dispersed all along the river drainage basin considered?

13. What is the documentation for the $500/acre lost benefit figure?

14. Are there figures included in the benefit-cost ratio for funds expended in mitigating the adverse impacts?

15. Has the cost of building Dickey-Lincoln been compared to the costs of pumped storage?

16. In calculating the power benefits, were the following considerations included?
    a) How were load management reforms used in determining peak load benefits for Dickey-Lincoln?
    b) Were considerations given to small hydro projects in computing the benefit-cost ratios?
    c) Were income and price trends used in computing Dickey-Lincoln peak load benefits?

17. This question included 9 questions posed by Hansen; for his comments see Appendix B.

18. Is the postage stamp pricing approach for Dickey-Lincoln power usual or unique to this project?

19. Has the 438 Giga-Watt-Hour figure been corrected for pumped storage use of the power?

20. To what extent has the loss of recreational opportunities been used in figuring recreational benefits? Is this has not been done, why not?

21. Is the preference customer power allocation consistent with the statute regulating this allocation?

APPENDIX B

INDIVIDUAL RESPONSES FROM WORKSHOP PARTICIPANTS

A. Myrick Freeman - Bowdoin College
Edward Lee Rogers - Natural Resources Council of Maine
James C. Hansen - Municipal Electric Association of Vermont

BOWDOIN COLLEGE

DEPARTMENT OF ECONOMICS BRUNSWICK, MAINE 04011

May 23, 1977

Dr. Ken Fink
Walpole, Maine 04537

Dear Ken:

As you requested at this morning's Dickey-Lincoln workshop, here is a short summary of the point I was making at the close of the session.

There is a consensus among economists on many points concerning the methodology, assumptions, and techniques for using benefit-cost analysis for project evaluation. In several important respects the methodology and techniques used by the Corps of Engineer in evaluating the Dickey-Lincoln project depart from this professional consensus. The three most important departures concern the discount rate used to evaluate benefit and cost streams over time, the distinction between real and pecuniary effects of the project (e.g., the inclusion of taxes as a cost for private alternatives), and the choice of alternatives as a basis of comparison (e.g., privately vs publicly financed power alternatives). I elaborated on these and other points in a report prepared for the Natural Resources Commission several years ago. I have enclosed a copy of this report.

I should point out that the benefit-cost methodology employed by the Corps is, for the most part, dictated to it by Congress and the President (e.g., through the Water Resources Council). I am not blaming the Corps. But since one of the questions raised for the panel concerned the adequacy and appropriateness of methodologies, I thought it important to make this point.

The workshop was interesting and well handled. I appreciated the opportunity to participate.

Sincerely yours,

A. Myrick Freeman III

A. Myrick Freeman III
Professor of Economics and
Fellow, Resources for the Future,

AMF/ml
Enc.

THE BENEFITS AND COSTS OF THE DICKEY-LINCOLN PROJECT:

AN INTERIM UP-DATE

A. Myrick Freeman, III
Department of Economics
Bowdoin College

In June, 1974 I reviewed the Corps of Engineers' benefit-cost analysis of the Dickey-Lincoln School project. I found that the Corps had used inappropriate techniques and assumptions in calculating both the benefits and costs. The major problems involved the choice of a discount rate and the treatment of taxes and insurance. After making the necessary corrections, I computed revised benefit-cost ratios under alternative assumptions concerning discount rate. These ratios were substantially lower than the one computed by the Corps. On purely economic grounds the case for building the dams was weak. It would be further weakened by taking account of non-commensurate environmental costs.*

The purpose of this report is to examine the most recent data being used by the Corps and to compute new benefit-cost ratios using the appropriate techniques and up-to-date data. One surprising conclusion which emerges from this new data is that despite rising oil prices the economic case for Dickey-Lincoln is getting weaker. Even at the unrealistic discount rate of 3 1/4%, the benefit cost ratio as computed by the Corps has declined from 2.62 in 1974 to 2.07 as of October, 1976 (see Table 1). At the discount rate used by the federal government in evaluating new water resources projects, 6 3/8%, the corrected benefit-cost ratio is now only 1.01 and this does not take into account environmental costs.

I will now briefly describe the benefit and cost data and the assumptions and corrections underlying the alternative benefit-cost ratios for 1976 that are displayed in Table 2.

In Table 2, the first column data are based on the following assumptions:

- the cost of capital to the federal government is only 3 1/4%;
- the cost of capital to private utilities which would build alternative facilities if Dickey-Lincoln were not built is 10%;
- the federal government would not have to pay insurance on the Dickey-Lincoln facilities but insurance is a cost to private utilities; and

* See "The Benefits and Costs of the Dickey-Lincoln Project: A Preliminary Report" by A. M. Freeman. This report is available from the Natural Resources Council, 51 Chapel Street, Augusta, Maine 04330. Those interested in a discussion of the logic and rationale of benefit-cost analysis and an explanation of the computations made by the author to the Corps of Engineers' computations should consult the earlier report.

TABLE 1

COMPARISON OF BENEFIT-COST RATIOS

		1974	Oct. 1976
1.	Corps of Engineers at 3 1/4%	2.62	2.07
2.	Corps of Engineers at 6 3/8%	n.c.	1.23
	corrected for taxes and insurance		1.01
3.	Freeman - at 8 3/4%	.99	.91
4.	Freeman - at 10%	n.c.	.80

n.c. - not computed

TABLE 2

BENEFITS AND COSTS - 1976

	(1) 3 1/4% Corps	(2) 6 3/8% Corps	(3) 6 3/8% Corrected
Benefits (per year)			
Power	72,123,000	72,123,000	58,631,000
Recreation	1,250,000	1,250,000	1,250,000
Redevelopment	1,240,000	1,980,000	1,980,000
Flood Control	507,000	507,000	507,000
Total Benefit	75,120,000	75,860,000	62,368,000
Costs (per year)			
Economic Costs	36,251,000	61,051,000	61,584,000
Environmental Costs	X	X	X
Economic Benefit Cost Ratio	2.07	1.23	1.01

- the taxes paid by private utilities are real economic costs to the society as a whole.

There are the assumptions most favorable to Dickey-Lincoln, that is, they each have the effect of raising the computed benefits or lowering computed costs. The benefit-cost ratio is 2.07.

Column 2 of Table 2 makes a partial correction for the unrealistic cost of capital to the federal government. Using a discount rate of 6 3/8% substantially raises costs and lowers the benefit-cost ratio to 1.23.

But even this figure is too high. It is a basic principle of benefit-cost analysis that alternatives should be compared and evaluated according to the same rules, i.e., on an equivalent basis. If the federal government is assumed to be able to obtain capital at 6 3/8% to build Dickey-Lincoln, then the alternative source of power (the costs of which define the benefits of Dickey-Lincoln) should also be evaluated at 6 3/8% and no payment of taxes assumed. When this is done the power benefits fall from $72.1 million to $58.6 million. Insurance, i.e., the cost of bearing the risks of accident, etc., is also a real cost to whomever builds a power project. An insurance factor has been added to project costs using procedures set out by the Federal Power Commission. These adjustments lower the benefit-cost ratio to 1.01.

Benefit-cost ratios were computed on the basis of two other discount rates. The results are shown in Table 3. The rate of 8 3/4% was chosen since this rate was also used in my earlier report. This was done to enable another comparison of benefit-cost ratios at different points in time. As Table 1 shows, the benefit-cost ratio is declining because the costs of building Dickey-Lincoln are rising faster than the costs of building and operating alternative sources of power.

The 10% discount rate was used because this is now reported by the Federal Power Commission to be the cost of capital to private utilities. In both cases in Table 3, power benefits were adjusted so as to treat taxes as a transfer from utilities to governments rather than as a real cost to society, and to include insurance costs for Dickey-Lincoln.

TABLE 3

MORE BENEFITS AND COSTS - 1976

	(1) 8 3/4% Corrected	(2) 10% Corrected
Benefits (per year)		
Power	63,213,000*	65,250,000
Recreation	1,250,000	1,250,000
Redevelopment	1,980,000*	1,980,000*
Flood Control	507,000	507,000
Total Benefits	66,950,000	68,987,000
Costs (per year)		
Economic Costs	73,350,000	86,065,000
Environmental Costs	X	X
Economic Benefit Cost Ratio	.91	.80

*Approximate - precise data not available

THE BENEFITS AND COSTS OF THE DICKEY-LINCOLN PROJECT: A PRELIMINARY REPORT

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I. Introduction

The Dickey-Lincoln School Hydro Power Project was authorized by Congress in 1965. Advanced engineering and design work was then begun by the Army Corps of Engineering in early 1966. Further detailed design work was suspended in November, 1967 because of Congress' failure to appropriate further funds for design or construction. However, it now appears likely that Congress will include funds for continued design and engineering work in its appropriations for fiscal year 1974-75.

Each year since 1967, the Corps has used indexes of construction costs and other price indexes in order to update the estimates of construction costs to reflect current cost and price conditions. The Corps has also revised and updated the estimates of hydro electric power benefits to reflect changing economic conditions. On the basis of the detailed analysis done prior to 1967 and the subsequent revisions, the Corps presently estimates that the ratio of total benefits to total costs for Dickey-

Lincoln is 2.6. However, there are two major limitations to this estimate of a benefit-cost ratio. First is that the basic data and analysis underlying the benefit-cost ratio are now almost seven years old, and the subsequent adjustments only imperfectly reflect changes in economic conditions since 1967. The second reservation is that the economic techniques and methods used to calculate the benefit-cost ratio are faulty in several important respects.

In this report, I will be able to deal only with problems of technique and methodology. The work reported below is also based upon the 1967 data as revised and updated by the Corps of Engineers. However, this work does apply different techniques and methods which are considered to be correct by economists and shows that the consequence of applying correct techniques and methods leads to conclusions about the economic feasibility of the Dickey-Lincoln Project which are substantially different from those of the Corps of Engineers. Specifically, when appropriate techniques are used, the "true" benefit-cost ratio is shown to lie somewhere between 0.9 and 1.2 depending upon the assumptions made about key variables. The difference between the high and low estimates of the benefit-cost ratio is small compared to the range of uncertainty and possible error stemming from the use of old and possibly outdated data.

There are three ways in which the techniques and methods used by the Corps tend to overstate the degree of economic feasibility of the Dickey-Lincoln Project. First, the techniques

used to calculate the benefits due to hydro electric power generation lead to overestimates of hydropower benefits. Second, the assumptions concerning the cost of capital used in construction of the project lead to a substantial underestimate of construction costs. And third, not all of the true costs of the project construction are counted. Specifically, the benefit-cost analysis ignores the cost of environmental change and the losses of recreation, fish, and wildlife values associated with a freeflowing undeveloped river. If the Corps' benefit-cost analysis is corrected to take into account the first two points above, the revised benefit-cost ratio is reduced to somewhere between 0.9 and 1.2. Then, if due weight is given to the environmental damages, it appears that they would tip the scale against the project construction.

It must be emphasized that the findings reported in this paper are not definitive. If funds for further design work and study are authorized by Congress, the Corps of Engineers will be able to generate new and more up-to-date data and analysis on costs and benefits. In addition, the Corps will be required by law to prepare and circulate an environmental impact statement (EIS) "which will ensure that presently unquantified environmental amenities and values may be given appropriate consideration in decision making along with economic and technical considerations (National Environmental Policy Act of 1969)." The EIS must incorporate data on economic benefits and costs as well as environmental benefits and costs, and it must identify and evaluate alternative ways of meeting the project objectives. When the

Corps' studies are completed and the EIS circulated, independent analysts and other parties of interest will have substantially more information for their debate about the merits of the project. Since these data are not presently available, the primary purpose of this report is to illustrate the importance of using correct analytical techniques and procedures in evaluating benefits and costs, and to focus attention on the critical variables and components of the data.

The next section will outline the rationale for a benefit-cost analysis and the principles to be used for defining and measuring economic benefits and costs. Subsequent sections will review and critically evaluate the most recent benefit-cost analysis undertaken for the Corps of Engineers.

II. The Principles of Benefit-Cost Analysis

In the most general sense, benefit-cost analysis is simply the application of common sense -- no more, no less. It means that whenever one is confronted with a choice or a decision as to whether to undertake a course of action, he should identify and list all of the beneficial or favorable consequences that will stem from taking that action and compare these with all of the possible adverse consequences or costs of taking that action. If the beneficial consequences are perceived to outweigh the adverse consequences, the action should be undertaken. At this level of generality the only alternatives to rational weighing of benefits and costs are the use of the essentially arbitrary decision making rules (for example, always say no) or random choices (for

example, coin flipping).

Benefit-cost analysis might best be seen as a scale or balance where the benefits are piled on one tray, the costs are piled on the other and the purpose is to see which way the scales tip. However, this analogy points to one of the limitations to applying the rationale of benefit-cost analysis. The objective application of benefit-cost analysis to decision making requires that all of the benefits and the costs be expressed and measured in some common units, for example, weight in the case of the scales.

One of the major stated purposes of water resources development projects is to increase the overall efficiency of the economic system in the use of resources such as labor, capital, and land in the production of goods and services. The appropriate scale or yardstick to apply to projects undertaken in the name of economic efficiency is dollar values. The measure of the favorable effects of such a project would be the dollar value of the goods and services produced by the project where values are determined by or measured by the willingness to pay of individuals to receive these outputs. In many instances, the outputs of projects are not sold in markets, so that dollar value or willingness to pay is not regularly observed or recorded. For example, an individual would be willing to pay something to use the road between his home and his workplace even though no tollbooth has been set up to exploit that willingness to pay. In these cases willingness to pay and value must be estimated or inferred on the basis of other information. Part of the art of benefit-cost analysis is

the development of these techniques for estimating values.

On the cost side, the appropriate measure is the value of other goods and services which must be foregone or given up in order to free the resources for utilization in this project. This is the notion of opportunity costs. For example, if a certain project requires a year of work by a laborer, the cost is what that laborer would have produced elsewhere if he had not been utilized in this project. That is the opportunity cost of labor. In a market economy, the prices of resources such as labor, capital, and land are usually accurate measures of their opportunity cost. But for some resource inputs, market values are not available; hence opportunity costs must be estimated or inferred on the basis of other information. For example, if a hydroelectric project requires the damming of a free flowing river, one of the things that is lost or foregone in undertaking the project is the value of the recreational, fish, wildlife, and other environmental services provided by the river in its natural state. While these values are not readily measurable in dollar terms, their loss is surely a cost which must be weighed against whatever benefits the project is supposed to bring.

Benefit-cost analysis can be a truly reliable guide to making decisions on resource allocation only if all of the benefits and costs are identified, measured, and placed in dollar units so they can be weighed on the economist's scale. Clearly this is a counsel of perfection. These conditions can never be met totally. No benefit-cost analysis can adequately identify and measure all

of the relevant variables. This does not mean that benefit-cost analysis should be scrapped as a guide to decision making. But also it does not mean that benefit-cost analysis should proceed by counting only those things for which dollar price tags are available and ignoring those favorable and adverse effects which cannot be readily expressed in dollar terms.

There is a middle ground which makes maximum use of the available information. This is first to provide an accounting of all the benefits and costs which can be expressed in dollar terms, and second, to accompany this with a description of and quantification of the other favorable and adverse effects which are expected to stem from the project.[1] This listing permits persons involved in the decision making process to identify and assess the non-economic consequences of economic decisions.

While an adequate listing of the non-economic consequences of undertaking the Dickey-Lincoln project is not yet possible, the National Environmental Policy Act is meant to ensure that this information is compiled and made available to persons involved in the decision making process.

III. The Corps' of Engineers Benefit-Cost Analysis

On the basis of the earlier design and engineering studies updated for changes in construction costs and prices over the last

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1. This is essentially what is called for by the Water Resources Council in "Principles and Standards for Planning Water and Related Land Resources." This is also consistent with the requirements of the National Environmental Policy Act.

seven years, the Corps of Engineers estimates that the dam and associated power facilities will cost $384,800,000 including interest during construction. In addition, transmission facilities are expected to cost $129,100,000. Half of the investment in transmission facilities is attributed by the Corps to the Dickey-Lincoln project, i.e., the Dickey-Lincoln share is $64,550,000. The total construction cost for the facilities in current dollars is estimated to be:

Investment in dams and generating equipment	$384,800,000
Transmission facilities	64,550,000
Total investment	$449,350,000

In most presentations of benefit-cost data, both the benefits and the costs are expressed in terms of annual flows or dollars per year. This requires that the total investment incurred at the beginning of the project be converted into an annual equivalent flow of dollars per year spread out over the entire life of the project. The annual equivalent of investment costs can be interpreted as the amount required in equal annual installments to recoup the initial investment plus interest over the life of the project. The Corps assumes that the Dickey-Lincoln dam will have a useful life of 100 years. They assume that interest would be charged at the rate of 3 1/4% per year. The annual costs used below are based upon these assumptions. The annual benefits and costs as calculated by the Corps of Engineers are as follows:

ANNUAL BENEFITS	PER YEAR
The value of electric power	$44,365,000
Flood control damages avoided	60,000
Recreation benefits	1,250,000
Redevelopment benefits	817,000
Total annual benefits	$46,492,000

ANNUAL COSTS	
Annual equivalent of investment costs plus operation, maintenance and replacement 100 years at 3 1/4%	$17,742,000

BENEFIT TO COST RATIO	2.6

IV. Review and Critique

There are three major criticisms to be made of the Corps' benefit-cost analysis. The first concerns the technique for estimating hydroelectric power benefits. The second is the assumption concerning the cost of capital or the interest rate used to calculate annual project costs. And the third concerns the omission of the costs of environmental changes.

If it can be shown that the electrical energy to be produced by Dickey-Lincoln would be produced by some other source if Dickey-Lincoln were not built, then the cost of producing electrical energy from the alternative can be used as a measure of benefits of Dickey-Lincoln power. This is because if Dickey-Lincoln were built, it would not be necessary to use labor, capital, and other resources in constructing and operating the alternative. That savings in resources as measured by the cost of the alternative is the benefit of using Dickey-Lincoln to generate

the electrical energy.

The proper application of the "cost of alternative" technique for estimating benefits requires both the identification of an appropriate alternative, and the correct measurement of the cost of that alternative. The Corps of Engineers has assumed that in the absence of Dickey-Lincoln, a combination of oilfired steam base load equipment in Maine and gas turbine equipment in Boston would be the most likely alternative to meet existing and projected changes in the demand for electric energy.

The Corps can be criticized for not considering a wider range of alternatives both for providing increments to supply and for altering the patterns of demand. For example, a full investigation of the economic feasibility of Dickey-Lincoln as a source of peaking power for New England would require an investigation of the effect of peak load pricing on the load curve and the growth in electricity demand. If peak load users were charged something approaching the marginal costs they impose on the system, it is possible that changes in the time pattern of electricity demand would make additional investments in peaking capacity such as Dickey-Lincoln unnecessary. Also some less conventional supply alternatives should be investigated, including the recent suggestion that sustained yield management of the forestry area proposed to be flooded by Dickey-Lincoln could produce enough wood fuel to support an equivalent sized steam generating facility at competitive cost. It is beyond the scope of this paper to analyze these alternatives. It should be noted, however, the

Corps is required by law to investigate and evaluate the full range of alternatives as part of its environmental impact statement.

The proper measurement of the cost of the alternative requires an understanding of the distinction between real costs and financial costs. Real costs are the opportunity costs of the labor, capital, and other resources actually used in the construction and operation of the alternative. Financial costs are those money payments that are recorded on the books of the constructing and operating agency. The real costs of a particular facility are independent of who constructs and operates that facility. But financial costs of a given facility can vary depending upon the identity of the operating agency. For example, if a privately owned utility company builds a generating facility, it must pay substantial amounts in real property taxes to the local taxing authority. An identical facility owned and operated by a public agency will be tax exempt. The real cost of the two facilities would be the same, but the financial costs are different. It is the real costs of the alternative facility which are relevant as a measure of the benefits of a hydroelectric development such as Dickey-Lincoln.

The Corps assumed that the alternative to Dickey-Lincoln would be privately owned. In calculating the cost of this alternative, the Corps included substantial amounts of federal and local taxes -- financial costs but not real resource costs. The Corps also included the cost of insurance in its measure of cost

of alternatives. This is legitimate in that insurance represents a cost of bearing the risk of possible accidental loss or damage. However, no comparable charge for insurance was included in the cost estimates for Dickey-Lincoln. Since the alternatives must be evaluated on a comparable basis, either the insurance cost must be deducted from the cost of alternatives or an additional charge for insurance should be added to the cost of Dickey-Lincoln. The latter procedure is used below in a subsequent section where revised benefit-cost figures are presented.

The cost of alternatives and therefore the estimates of hydroelectric power benefits are quite sensitive to the assumptions made about the cost of fuel oil used in the alternative. The estimates used by the Corps in their most recent evaluation were made in January 1974 in the midst of great uncertainty about the future course of fuel oil prices. It is essential that the benefit estimates be revised to take into account the most recent data on fuel prices. And it would be desirable to present alternative estimates of hydroelectric benefits based on different assumptions about future oil prices.

The interest rate or discount rate used to convert investment costs to annual equivalent costs may be the most important single variable in determining the benefit-cost ratio for very long-lived investments such as hydroelectric dams. The interest rate represents the opportunity cost to society of the capital used to build a project which yields its benefits over a long period of time. The best measure of the cost of capital to society

is the rate of return or interest that the capital could earn if placed in some alternative investment.

Most economists agree that the best measure of this opportunity cost is the rate of return on investment in the private sector of the economy. Although there is some disagreement as to the precise figure, most economists would agree that this rate of return and the discount rate which should be used in benefit-cost analysis lie somewhere between 8% and 10%.

Federal policy governing the choice of a discount rate for use in benefit-cost analysis has been a major source of political controversy. A high discount rate used in project analysis leads to high estimates of project costs and low benefit-cost ratios. The choice of low discount rates has the opposite effect. Federal policy established in 1962 based the discount rate on the coupon interest rate of outstanding long term U.S. Treasury securities (Senate Document 97). Because of a technicality of federal law, the only long term government securities outstanding during the 60's were issued during the late 1940's and earlier. Because of the unusual money market conditions of the time, all of these securities carried unusually low coupon rates. As a consequence the discount rate used in evaluating projects during the 60's, including Dickey-Lincoln, reflected the unusual money market conditions of twenty years before and bore no relationship to current money market conditions or opportunity costs of capital.

This situation would have been substantially corrected if the Proposed Principles and Standards for Planning Water and

Related Land Resources promulgated by the Water Resources Council in December 1971 had been adopted. In the Proposed Principles, the Water Resources Council endorsed the principle that "the opportunity cost of all federal investment activities, including water resource projects, is recognized to be the real rate of return on non-federal investments," and citing recent studies of real rates of return, stated "the appropriate rate for evaluating government investment decisions is approximately 10% and is substantially invariant to short term changes in economic and money market conditions" (Water Resources Council, 1971, pp. 24147, 24167).

This position could not withstand the political pressure for more lenient project evaluation. In the final Principles and Standards for Planning Water and Related Land Resources ratified by President Nixon in September, 1973, the Water Resources Council retreated to the position that "the government's investment decisions are related to the cost of federal borrowing," and established the discount rate for the evaluation of new projects at 6 7/8% (Water Resources Council, 1973, pp. 34784, 24822).

Even this retreat was not enough for Congress. The Water Resources Development Act of 1974 further lowers the discount rate to be used in evaluating projects which have not yet been authorized by Congress. The Act also includes the so called "grandfather clause" which requires that all subsequent evaluations of projects which have once been authorized by Congress be analyzed using the discount rate in force at the time of Congres-

sional authorization. Since Dickey-Lincoln was authorized in 1965 under the old policy, the discount rate to be used for current evaluation and analysis must still be the outdated and quite unrealistic 3 1/4%.

As will be shown below, if the discount rate of 6 7/8% recommended by the Water Resources Council is used, and other appropriate adjustments are made, Dickey-Lincoln is only marginally justifiable on narrow economic grounds. Higher discount rates push the benefit-cost ratio below one. And if a 10% discount rate reflecting the true opportunity cost of capital is used, the project would be clearly unjustifiable on economic grounds alone.[2]

The third major criticism of the Corps' benefit-cost ratio is its failure to reflect all of the opportunity costs of constructing the dam and in particular the opportunity cost of diverting a free flowing river and its associated wildlands and forests to hydrological storage purposes. As was argued above, it is essential that even those costs which cannot be valued in monetary terms must be identified and quantified where possible so that decision makers can be aware of them and weigh and assess them in relation to the measured economic benefits in their dollar dimension. The Corps of Engineers will be compelled to provide information of this kind as part of their project evaluation when

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2. Since one of the real costs of construction is interest during construction, use of a higher discount rate would also mean a higher total investment. The results reported below do not include this adjustment.

they draw up an environmental impact statement for Dickey-Lincoln.

In addition to the three major criticisms raised above, there are several points to be made concerning the other components of benefits estimated by the Corps. The Corps estimates $60,000 per year in flood control benefits. These benefits are measured by the expected value of flood damages avoided by the construction of the dam. This is an appropriate measure of flood control benefits provided that the dam structure is the least costly method for preventing the economic damages to the flood threatened areas. However, if alternative flood damage prevention measures can provide equivalent protection at a cost of less than $60,000 per year, then the cost of the alternative is the appropriate measure of flood control benefits. As part of its project analysis and environmental impact statement, the Corps will have to consider alternative means of providing the flood protection to Fort Kent and neighboring areas.

The second largest class of benefits identified and measured by the Corps is recreation opportunities on the lake. The Corps estimates an average use of approximately 833,300 recreation-days over the life of the project. They assume a value per recreation-day of $1.50 yielding total recreation benefits of $1,250,000 per year (Corps of Engineers Letter dated April 26, 1974).

It is difficult to know what to make of this estimate. There are analytical techniques for predicting future recreation use at potential sites. But it is unclear whether the Corps used any of

these techniques in arriving at their projected figure for use. In the absence of any documentation for their estimate, it is difficult to take it at face value. Given the distance of the site from major population centers, the low population of the immediate area, the relatively low quality of the recreation experience to be provided, and the availability of many superior quality locations for flatwater recreation within the state, it seems likely that the 833,300 recreation-days per year is a substantial overestimate of recreation use.[3]

Also the unit value assigned by the Corps requires further examination. There are analytical techniques for estimating a willingness to pay per user day on the part of individual recreationists. However, these techniques are difficult and time consuming to apply to individual sites. As a substitute, the Water Resources Council "Principles and Standards" authorized project analysts to assign a unit value to general recreation experiences of between $0.75 -- 2.25 (Water Resources Council, 1973, p. 24804). The choice of a value within that range is to be made on the basis of the quality of the site (which would include distance and accessibility) and availability of substitute or alternative recreation sites. In the case of the Dickey-Lincoln lake, these considerations would appear to argue for a unit value

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3. Since isolated numbers are difficult to interpret without some frame of reference for comparison, the following figures are provided to put the Corps' estimate in perspective. The visitor-days at Acadia National Park in 1970 totalled 2,800,000; while visitor-days along the Allagash Waterway for the same year were only 37,000.

toward the lower end of the range.

Finally, if recreation benefits are to be counted, accurate and complete benefit-cost accounting calls for the inclusion of two additional kinds of costs. The first is the cost of constructing and operating recreation facilities such as campgrounds, bathhouses, boat ramps, etc. Although these will be borne, at least in part, by the state rather than the federal government, they nonetheless represent real resource costs and must be included in the analysis. More importantly, if the analysis is to count recreation opportunities on the lake to be created, it must also count recreation opportunities lost in the area to be flooded. This point has been emphasized above.

Finally, the Corps counts as redevelopment benefits a portion of the wages to be paid for constructing the project and during early years of operation, arguing that some of these wages will go to workers presently unemployed or underemployed within the project area. The logic of the argument is acceptable. The opportunity cost of utilizing a presently unemployed worker in the construction of the dam is zero. This fact can be reflected either by a downward adjustment of estimated construction costs, or by assigning an offsetting benefit of wages to unemployed workers. However, the estimates of the numbers of unemployed and underemployed workers available for the project were based on labor market surveys done seven or eight years ago. The Corps will have to make a new survey to determine the present labor market conditions in this area. Furthermore, the logic of the argument

also compels us to look for possible offsetting adverse employment effects in the region. For example, if flooding of forest land causes a reduction in employment in the wood products industries, there may be offsetting unemployment effects which should be counted against the redevelopment benefits. If some workers in the wood products industries experience prolonged periods of unemployment, i.e., if they are unable to move quickly into alternative employment, then the net effect of the project on unemployment in the region would be smaller than estimated by the Corps. And accordingly redevelopment benefits would be reduced.

V. Revising the Cost-Benefit Ratio

In this section some of the major adjustments to the Corps of Engineers figures that are discussed above are made and the results summarized. The critical variable in the benefit-cost analysis is the discount rate used as an estimate of capital cost. In this section I will present the revised benefit-cost ratios under two alternative assumptions: the first being a discount rate of 6 7/8% as recommended in the "Proposed Principles and Standards" of the Water Resources Council; and the second being a discount rate of 8 3/4% which the Federal Power Commission estimates as the cost of capital to the private utility industry. The 8 3/4% discount rate is used here primarily because of the ready availability of data on the cost of alternative electricity supplies based on this discount rate.

At a discount rate of 6 7/8% and an estimated project life

of 100 years, the annual equivalent of construction costs and operating, maintenance, and replacement costs is $33,349,000. The Federal Power Commission has provided comparable estimates of the cost of alternative sources of electrical energy also based on a discount rate of 6 7/8% (Federal Power Commission Letter, January 29, 1974). These cost estimates do not include taxes or insurance for the private alternatives; so they are strictly comparable with the estimate of the cost of the hydroelectric project. The hydro power benefits based on the cost of the alternative are $37,304,000. The ratio of hydro power benefits alone to total project costs is 1.12.

We lack an empirical basis for revising the Corps' estimate of recreation, flood control and redevelopment benefits. However, it seems more likely that these are overestimates of the true value rather than underestimates. However, utilizing the Corps' estimates of these other benefits, the benefit-cost situation can be summarized as follows:

ANNUAL BENEFITS	PER YEAR
Hydro power benefits	$37,304,000
Recreation benefits	1,250,000
Flood control	60,000
Redevelopment	817,000
Total annual benefits	$39,431,000
ANNUAL COSTS	$33,349,000
Additional costs of environmental damages	(value unknown)
BENEFIT TO COST RATIO	less than 1.18

When the 8 3/4% discount rate is used, the annual equivalent of costs is equal to $42,192,000.[4] The Federal Power Commission has also estimated the costs of providing alternative power with an assumed cost of capital of 8 3/4%. The FPC's estimate included the cost of taxes. Their estimate of the cost of alternative is $43,802,000 (Federal Power Commission Letter, January 29, 1974). In order to make this figure comparable with the cost of the hydro electric development, it is necessary to deduct the financial cost of taxes from this estimate. The data to make a precise determination are not available. However, data in Federal Power Commission Hydro Electric Power Evaluation make it possible to make an approximate adjustment.[5] The cost of alternative power, net of charges for taxes, was calculated to be $39,747,000. Adding the Corps' estimates of flood control, recreation, and redevelopment benefits yields the following summary table:

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4. This includes $449,000 per year for insurance as recommended by the Federal Power Commission. See Federal Power Commission, 1968, p. 80.

5. Table 50 shows that perhaps over a third of the capacity cost of the coal fired alternative is due to charges for federal, state and local taxes. To be conservative, it was assumed here that one quarter of the capacity charges for the gas turbine and oil fired systems were due to charges for taxes.

ANNUAL BENEFITS	PER YEAR
Hydro electric power benefits	$39,747,000
Recreation benefits	1,250,000
Flood control	60,000
Redevelopment	817,000
Total annual benefits	$41,874,000
ANNUAL COSTS	$42,192,000
Additional costs of environmental damages	(value unknown)
BENEFIT TO COST RATIO	less than 0.99

To summarize, in this section we have adjusted the estimates of benefits and costs provided by the Corps to take into account the proper procedure for defining and measuring the benefits of hydor power development and to reflect more accurately the opportunity cost of capital. Under assumptions most favorable to the project, i.e., a 6 7/8% discount rate and zero environmental damages, the ratio of benefits to costs is approximately 1.2. This is clearly an upper bound estimate. The true figure would be less than this if the environmental costs of the project could be included.

Under the more realistic assumption of an 8 3/4% discount rate, the upper bound estimate of the ratio of benefits to costs is 0.99. Taking into account the environmental damages and the possible overstatement of recreation benefits simply reinforces the conclusion that the project is not economically justifiable at this discount rate. And at a 10% discount rate, the benefit-cost ratio would be substantially below 1.0.

The economic case for the Dickey-Lincoln project is hardly overwhelming. In fact even under the most favorable assumptions, the excess of benefits over costs is small compared to the possible errors in the magnitudes of all variables due to a reliance on outdated data and estimates from the 1966 and 1967 studies by the Corps. This suggests the need not only for further study, but also great caution before large commitments of environmental and economic resources are made.

REFERENCES

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NATURAL RESOURCES COUNCIL OF MAINE
51 chapel street, augusta 04330

May 27, 1977

Kenneth Fink
Walpole, Maine
04573

Re: Workshop on Project Economics and Power Marketing, Dickey-Lincoln School Hydroelectric Project, May 24, 1977, University of Maine, Augusta

Dear Ken:

The following comments are submitted in accordance with the instructions in that regard made at the workshop. We are concerned that the following areas have not been adequately considered or analyzed in the cost-benefit analyses that has been undertaken thus far for this project:

1. Economic and Recreational Opportunities Foregone. A cost-benefit analysis, properly undertaken, requires a careful appraisal of opportunity costs of the project. That is, to determine what the net benefits of the project are, it is essential to determine what the true costs of the project are in terms of opportunities precluded by the project. Areas of particular concern include, but are not necessarily limited to, the following subjects:

A. Lost Economic Opportunities in the Timber Industry. The assumption seems to have been made that during the life of the project, there will be an ample supply of timber and therefore no lost timber (including timber for pulp and paper) production in the State of Maine as a consequence of the project. We find it difficult to believe that a reasonably reliable prognosis of the demand for wood fiber during the life of the projects suggests such a supply surplus. Moreover, it must be borne in mind that the project will result in the loss of an area of well-managed stocks, sustaining substantial yields of timber indefinitely. Even assuming an adequate supply of fiber elsewhere, any new area would face the competitive disadvantages of the cost of new roads, timber stand improvement costs, lower yields, as compared to the high productivity of the St. John Valley, etc. thereby resulting in a substantial loss of the share of the market now enjoyed by the area's forests and the products from this forest. A careful analysis of such factors must be undertaken if there is to be anything approaching an accurate appraisal of the economic impact of the project.

Similarly, employment opportunities in the woods that will be lost as a consequence of the project's destruction of woodlands must be undertaken. What of the lost job opportunities for those whose mobility is not such as to permit them to seek work elsewhere? Will they simply swell the ranks of the unemployed or underemployed, rather than move to a remote new woods work site? Will the substitute area actually be available to the displaced workers or will it be in a process of being harvested by others or, as indicated above, simply not competitively viable?

Statewide

The Allagash Environmental Institute
American Association of University Women, Maine Division
Appalachian Mountain Club, Maine Chapter
Audubon Naturalist Council
Coastal Resources Action Committee
Congress of Lake Associations
Conservation Education Foundation
Friends of Intelligent Land Use
Garden Club Federation of Maine
Landguard Trust, Inc.
League of Women Voters of Maine
Maine Association of Conservation Commissions
Maine Association of Planners
Maine Audubon Society
Maine Coast Heritage Trust
Maine Lung Association - Clean Air Committee
Maine Organic Farmers and Gardeners Association
Maine Snowmobile Association
Maine Waste Water Control Association
The Nature Conservancy, Maine Chapter
New England Wildflower Society
Penobscot Paddle and Chowder Society
Pine Tree State Rifle and Pistol Association
Sam Ely Community Land Trust
Society of American Foresters, Maine Chapter
State Biologists' Association
The Thoreau Fellowship
Trout Unlimited

Regional and Local

Abnaki Ski and Outing Club
Annabessacook Lake Improvement Association
Arnold Expedition Historical Society
Aroostook River Fish and Game
Associated Sportsmen's Clubs of Cumberland County
Augusta Nature Club
Bangor Nature Club
Bates Outing Club
Bath Garden Club
Berwick Conservation Commission
Biddeford Pool Improvement Association
Boothbay Region Garden Club
Brooklin Garden Club
Camden Garden Club
Central Aroostook Soil and Water Conservation District
Chewonki Foundation
Citizens Who Care
Cobbossee Yacht Club
Colby Environmental Council
Damariscotta River Association
Damariscotta Lake Association
Effluent Society
Fin and Feather Club
For the Love of Eastport
Forest City Rod and Gun Club
Friends of Nature, Inc.
Friends of Webb River
Georgetown Conservation Commission
Harpswell Conservation Commission
Harpswell Garden Club
Harrison Conservation Commission
Hobbs Pond
Houlton Fish and Game Association
Kennebec Valley Conservation Association
Keyes Pond Association
Kezar Lake Association
Knox County Fish and Game Association
Lakes Environmental Association
Lebanon Conservation Commission
Lincoln County Cultural Historical Association
Lisbon Fish and Game Association
Longfellow Garden Club
Lovell Conservation Commission
Maine Outing Club
Megunticook Lake Association
Merrymeeting Audubon Society
Merryspring Foundation
Mid-Coast Audubon Society
Milbridge Conservation Commission
Moose Pond Environmental Improvement Association
Mooselookmegunticook Improvement Association
Mousam River Protection Association
Murray Hill Association
Northeast Audubon Society
North Kennebec Regional Planning Commission
Oakland Garden Club
Old York Garden Club
Orono Conservation Commission
Osewantha Garden Club
Pemaquid Watershed Association
Penobscot Valley Chapter, Maine Audubon Society
Penobscot Watershed Conservation Affiliates
Piscataqua Garden Club
Prestile Fish and Game Club
Presque Isle Fish and Game Club, Inc.
Rockport Garden Club
Saco River Corridor Association
Saco Valley Audubon Society
Saco Valley Fish and Game
St. Croix River Watershed Association
St. Mary's Garden Club
Sanford-Springvale Fish and Game Protective Assn.
Save Our Environment
Scarborough Fish and Game Association
Sebago Lake 31 Club
Sheepscot Valley Conservation Association
Sierra Club, Northeastern Group
Sierra Club, Mahoosuc Group
Skowhegan Sportsmen's Club
Somerset County Soil and Water Conservation Dist
South Berwick Save Agamenticus Committee
Southport Conservation Commission
Southport Summer Residents Association
Sports Unlimited of Maine
Sportsmen, Inc.
Spurwink Rod and Gun Club
Thomaston Garden Club
Thompson Lake Environmental Association
Waterboro Conservation Commission
Waterford Conservation Commission
Walters Ecological Experimental Station
Western Audubon Society
Westport Conservation Commission
Wildlife Society, Student Chapter, U of M, Oron
York Conservation Commission
York County Audubon Society
York County Fish and Game Association

B. Recreational Industry and Employment Opportunities Foregone. While we recognize that this is the subject of a separate workshop, it is worth noting here that the same type of analysis must be undertaken for recreational opportunities foregone as must be done for the timber industry. For example, white water canoeing has been, in recent years, among the fastest growing outdoor recreational pursuits in the United States. Absolute losses in this respect, as well as for fishing and hunting due to absolute losses of fish and wildlife habitat result from this project. Mitigation programs in these respects do not exist for white water recreational pursuits and, for that matter, do not provide new habitat for fish and wildlife. Adequate cost-benefit analysis requires reliable projections of the growth in those recreational pursuits and its accompanying industry that could have been anticipated and that will be lost. In that connection, the opportunities foregone must be analyzed from the perspective of an area where adequate public access, public information, and publicity would result in maximum utilization of the resource as a recreational area.

C. Redevelopment Benefits. In our view, redevelopment benefits, measured by the number of jobs provided to the area by the project, must be offset by the losses referred to above, as well as by the adverse economic impacts on local towns from the necessity of building new roads, schools, and other public services, and the boom and bust phenomenon that the towns will have to deal with as a consequence of a large influx of labor over a relatively short period of time. We are concerned that these problems have not been adequately addressed in the cost-benefit analysis undertaken to date.

D. Adverse Impacts on Labor. The project represents a substantial expenditure of public funds for a project which is not highly labor-intensive, as compared to other types of endeavors that could be undertaken with the same amount of money. A water resource project of this type and magnitude requires an intensive use of capital (equipment, machinery, etc.) as compared to many other public works activities that might be undertaken. For example, it has been reliably estimated that an energy conservation program calling for the insulation of buildings in New England would be highly labor-intensive and more than fulfill the power needs the project is supposedly designed to satisfy. The lost opportunity to labor as a consequence of the decision to invest public monies in this particular project, instead of alternative strategies to satisfy the alleged power demand, ought to be thoroughly evaluated. In that computation of losses to labor from the decision to go forward with this project should be added the lost job opportunities described above in the recreational and timber industries. Other alternatives foregone should also be discussed in terms of their impact on labor, some of which are hereinafter described.

E. Alternative Power Strategies Foregone. The monies spent on this project will not be available to develop other smaller pump storage facilities, small hydropower facilities, to initiate load management strategies or to develop a federally-subsidized conservation program, including the installation of building insulation in New England. The cost-benefit analysis should evaluate these alternative strategies to determine the true cost of the project. In connection with these alternatives, we are not at this time satisfied that their feasibility, cost, or desirability have been adequately evaluated.

2. Power Demand Assumptions. We are not satisfied that the power demands upon which power benefits are estimated are reliable. In particular, we are not satisfied that there has been adequate analysis of income and price trends which have a direct and immediate bearing on future power demands.

3. Marginal Cost Pricing as it Affects Marketability of Dickey-Lincoln Power. This project is being planned and justified primarily as a peaking plant, to satisfy power demands at times of daily and seasonal peaks in power demands. As is evident from the Federal Energy Conservation and Production Act, Public Law 94-385, 42 United States Code, Sections 6801-6892, federal law and policy now recognize the desirability of "load management techniques which are cost effective" and "rates which reflect marginal cost of service, or time of use of service, or both; * * *." In determining the marketability of Dickey-Lincoln power, then, a marginal cost analysis should be undertaken to determine the marginal costs that the peak load users are putting on the system in demanding that Dickey-Lincoln be built. Marketing analysis should likewise include the price that peak load users would have to be charged so that the marginal cost of this expensive plant could be attributed to those whose peak demands require its construction and operation. This would require a determination as to whether all or a substantial portion of the capacity costs of the project ought to be allocated to the peak demand users and what portion of those costs, if any, should be allocated to off-peak users of the power from this project. As we understand the marketing study that has been completed to date, no such marginal cost pricing analysis has been undertaken. Instead, power from the project would be sold essentially at the same rate regardless of the time of use. While the Department of Interior may be authorized to make that type of analysis, for purposes of estimating the price at which the power will be sold, informed decision making under the National Environmental Policy Act, interpreted in the light of such federal statutes as the Energy Conservation and Production Act, and the policies set forth therein, requires the marginal cost analysis heretofore described. Only with the benefit of such an analysis will decision makers be in a position to advise Congress whether or not there ought to be any change in the marketing and pricing directives under which this power will be sold to achieve the rate reforms heretofore discussed as set out in federal law.

4. Flood Loss Benefits. We are concerned that the figure of $500 per acre as a loss figure is not well-founded. We suggest that the validity of that figure be further scrutinized by computing the market value that such an annual figure would produce from the land in question. Conversely, one ought to look at present market values and from them work back to a realistic annual damage loss (and benefit) figure as a method of checking the realibility of the $500 figure.

The foregoing comments are not intended to be exhaustive of our concerns regarding the cost-benefit area. Obviously, we take issue with such matters as the use of a artificially low discount rate as well as treatment of taxes and insurance, all of which points were adequately elaborated on at the conference and need not be reiterated here in detail. For purposes of determining true costs and benefits, it is essential that a realistic discount rate be used, that taxes be treated as a transfer payment, not a real cost to the private power alternative and not to the governmentally-financed project, and that the insurance risks be recognized as a real cost regardless of whether the project is privately or federally financed. Only by the undertaking of an objective and validly designed cost-benefit analysis will the decision makers be made fully aware of the true costs and benefits of the project. That analysis may, of course, be accompanied by a cost-benefit analysis based on federal laws and directives that the Corps of

Engineers interprets as justifying a different discount rate and a different treatment of taxes and insurance. The point here is that a comparative analysis along the lines suggested above should be made for the benefit of the decision makers if the requirements of the National Environmental Policy Act regarding informed decision making are to be satisfied.

We reserve the right to make additional comments regarding the cost-benefit analysis methodolgy and data as we become aware of any other defects. We greatly appreciate the opportunity to submit these comments.

Sincerely yours,

EDWARD LEE ROGERS
Counsel

ELR/cmb

Municipal Electric Association of Vermont
c/o Lyndonville Electric Light Department
39 Depot Street
Lyndonville, Vermont 05851

May 27, 1977

Dr. L. K. Fink, Jr.
Walpole, Maine 04573

Dear Ken:

Both Harlan Titemore and I were pleased to have had the opportunity to participate in the workshop on Project Economics and Power Marketing for the Dickey-Lincoln School Lakes Hydroelectric Project in Augusta on May 24, 1977. As you know, time ran out before we could finish our discussions with representatives from the Corps of Engineers so by this letter we wish to express some thoughts that were left unsaid at the Augusta meeting.

Our comments and questions are directed to the proposed plan for marketing Dickey-Lincoln power. Page 11 of the Southeastern Power Administration (SEPA) report sets forth marketing guidelines and seven general principles. While we recognize that the ultimate marketing patterns may vary from the specific arrangements considered by SEPA, the seven general principles could well provide the mold in which specific arrangements are cast.

1. The first specific arrangement is sale by the Government of usable power directly to preference customers located in the marketing area. The marketing area is considered as all of New England including Maine, Massachusetts, Rhode Island, Connecticut, New Hampshire and Vermont. Maine is further considered as a special part of the marketing area. The amounts of 100 MW of 50 percent lead factor power and 100 MW of peaking power is reserved for Maine and the balance of 700 MW would be made available to the rest of the marketing area. The Maine allocation amounting to 100 MW of load factor power apparently was arrived at by projecting the 42 MW of Maine preference load in 1974 to 97 MW in 1986 (when Dickey-Lincoln becomes operational) and the 100 MW of peaking power was arrived at by continuing to forecast an increase in Maine preference load to 199 MW in 1986. Those projections represent an annual load growth rate of about 7 percent. The actual load growth between 1974 and 1986 may be less than 7 percent annually and if so, the Maine preference agencies would not be able to utilize their full 100 MW allocation by 1986 when Dickey-Lincoln is anticipated to become operational.

The suggested marketing arrangement would give the portion of the Maine load factor power not useable by Maine preference agencies to private utilities in Maine on a withdrawable basis. We believe such a withdrawable sale to private utilities would be inconsistent with the first specific marketing arrangement to sell power to preference agencies when Vermont preference agencies could also use that portion of the Maine allocation, also on a withdrawable basis, that might not be useable by Maine preference agencies.

2. The second specific arrangement considered by SEPA is that payment of transmission service charges would be made by the Government to the private utilities for wheeling Federal power to preference customers from points of interconnection of the Government's transmission facilities with the utility transmission system. On page 14 SEPA states "All transmission costs necessary to provide the power to the customer's premises would be borne by the Government." Do the wheeling costs cover transmission service to preference customers in Vermont including transmission and subtransmission service charges?

3. The third specific arrangement would be the establishment of "energy accounts" with the private utilities to more nearly represent power available under average water conditions. This type of arrangement apparently either assumes that preference agencies purchase their power requirements from the private utilities or that the private utilities would provide energy to firm up Dickey-Lincoln capacity (in dry years or to make load factor power). While such an arrangement would be beneficial to all-requirements wholesale customers, it would not necessarily be beneficial to those preference agencies that make their own power supply arrangements unless Dickey-Lincoln was "firm" power (i.e., including reserves). Eight of the preference agencies in Vermont make their own power supply arrangements (i.e., they do not purchase power under wholesale rate schedules). Those agencies can make power supply arrangements on a season-to-season basis thereby having flexibility to compensate for dry years on the Dickey-Lincoln watershed and, particularly to take advantage of wet years when large amounts of Dickey-Lincoln energy would be available. We question the need for Dickey-Lincoln power marketing to "lean on" the private utilities. The Vermont preference agencies would prefer to contract directly with the Government for the purchase of Dickey-Lincoln power rather than through the private utilities.

4. The fourth specific arrangement applies to preference agencies that purchase power under wholesale rate schedules where private utilities agree to supply additional power needs of preference agencies at applicable rate schedules. Such

an arrangement would have to include an agreement on accounting for Dickey-Lincoln power that makes the power useable in the preference agencies load shapes to insure proper credit for Dickey-Lincoln energy. (In Vermont, all utilities are credited with energy taken from each of their power sources hour-by-hour generally according to the rules of economic dispatch by computer calculations made after the end of each month from magnetic tape recorded at their billing points.)

5. The fifth specific arrangement is sale by the Government of a portion of the hydro power output to the private utilities as peaking power. Does this mean a permanent sale or a withdrawable sale? We expect that all of Dickey-Lincoln power can be used sooner or later by the preference agencies in New England. (See also Comment 6.)

6. The sixth specific arrangement would allow area utilities to schedule the power output to maximize the power benefits available from the project. We expect that "scheduling" as used in this context means day-to-day operation based on economic dispatch for the benefit of the New England region. The benefits of scheduling would accrue to the private generating and transmission utilities. We have no quarrel with such arrangements for operating purposes. However, we suspect that the preference agencies in New England, particularly in Massachusetts and Vermont, can use most if not all of Dickey-Lincoln peaking power. One means whereby full useability could be accomplished would be operating Dickey-Lincoln at reduced capacity for longer hours thereby fitting Dickey-Lincoln into the intermediate portion of the preference agency's load shapes. Then, with load growth operating capacity would be gradually increased to the peaking capability installed. We believe that the economics of power supply will indicate use of Dickey-Lincoln lower on the load curve. Of course, the power should be priced so as to return the same revenues from sales of power to the Government for intermediate operation of the project. Actually, load shapes for Vermont preference agencies are quite sharply peaked so that the top 30 percent of demand contains 7.5 percent load factor energy. Dickey-Lincoln operating at 11-15 percent plant factor is in the lower-peaking/upper-intermediate range in Vermont. The Vermont preference agencies would like the opportunity to discuss their need for and use of Dickey-Lincoln power with the Government before the Government makes arrangements to sell the power to private utilities.

7. We concur with the seventh specific arrangement for sale of power at postage stamp rates. However, we feel that the two-part rate, i.e., $50/kW plus 15 mills/kWh, may not be

appropriate for the peaking component. As discussed in Comment 4, preference agencies in Vermont are credited with energy taken from their power sources according to the rules of economic dispatch. Under those rules Dickey-Lincoln energy would be assumed taken only after all lower energy cost sources had been used. Either the rules for accounting for energy taken would have to be changed or the rate should be a single capacity rate with a zero mill per kWh component. A rate of $64.29/kW plus zero mills/kWh (equivalent to $50/kW plus 15 mills/kWh during an average water year) would insure that preference agencies in Vermont would receive full energy generated per kW entitlement.

We appreciated the opportunity to comment at the workshop session in Augusta and wholeheartedly endorse the workshop concept to provide public input to the Corps of Enginers in the preparation of their Draft EIS on the Dickey-Lincoln School Lakes project. The Vermont preference agencies are most interested in the project as a potential source of power to meet the energy needs of their electric consumers. We look forward to discussing marketing arrangements with the Government in the future.

Very truly yours,

James C. Hansen

James C. Hansen, P.E.
Consulting Engineer to the
Municipal Electric Association
of Vermont

cc: Harland Titemore, President
Municipal Electric Association
of Vermont

Walter Cook, Manager
Vermont Electric Cooperative

Harry Wright
Southeastern Power Administration

NEW ENGLAND DIVISION
U. S. Army Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02154

DICKEY-LINCOLN SCHOOL LAKES
Hydroelectric Project

Workshop

Aquatic Ecosystems

Tuesday Afternoon, 24 May 1977

at 2:00 PM

Room 253, University of Maine
Civic Center
Augusta, Maine

Report of Charles J. O'Leary
Recorder

On Tuesday, May 24, 1977, a workshop on Aquatic Ecosystems was held in Room 253, Civic Center, Augusta, Maine. The following participants, representing Maine-based organizations, were in attendance and participated in the development of questions:

O. H. Somers
Mid-Coast Audubon
Glenmere Road
Tenants Harbor, Maine

Matthew Scott
Garden Club Federation of Maine
DEP, Ray Building
Augusta, Maine

Joe Lupsha
Maine Forest Products Council
146 State Street
Augusta, Maine

Laura Vadney
League of Women Voters
RFD #1
South Harpswell, Maine

A. E. Brower
New England Wild Flower Society
8 Hospital Street
Augusta, Maine

Sally Surgenor
Appalachian Mountain Club
5 Joy Street
Boston, Massachusetts

Lyndon H. Bond, Chief
Fisheries Research Division
Department of Inland
Fisheries and Wild Life
State House
Augusta, Maine

Dr. Ken Fink served as discussion leader and gave a brief introduction stating the format and purpose of the workshop. Dr. Fink then introduced Col. John Chandler who gave a brief description and history of the Dickey-Lincoln School Lakes Hydroelectric Project.

The participants developed questions regarding the work of the consultant, Normandeau Associates, Inc., Bedford, New Hampshire (see attachment #1). Corps personnel and Christopher Schmitt, representing Normandeau Associates, responded to the questions and engaged in a discussion of points raised by the questions.

Summary of the Responses/Discussion to Participant Questions

Corps personnel indicated that some questions, e.g. sediment loads and erosion, would be addressed in future work on water quality. In general, participants felt question #4 needed further elaboration and clarification (A. E. Brower who raised this question outlined additional concern in a letter to the recorder (See attachment #2).

Participants felt more attention should be given to the research on mercury content in fish before making recommendations on lake trout.

The statements on page 58 of the Normandeau report beginning with the sentence "The standing forest..." were regarded as controversial.

The validity of information as applied to Maine lakes and fish species was the primary thrust of a series of questions listed by Mr. Bond.

In essence, the participants concern focused on the downstrea effects of the dams, research on mercury content in fish, loss and effect on flora and fauna, and validity of information as applied to Maine lakes.

Additional comments were requested of the participants if they felt their questions had not been adequately dealt with. As noted earlier, Mr. A. E. Brower responded to this request in attachment #2.

Attachment #1

List of Questions Suggested By Participants

In the Aquatic Ecosystems Workshop 24 May

1. Did the consultants investigate the source of sedimentation, especially land clearing in Canada and will that be short or long term? (Refer to page 40--Increased Levels of Timber Exploitation and Other Considerations).

2. In the consultant report there is reference to Corps studies 1976-77 in regard to nutrient load and water quality. Can that be more fully explained and referenced?

3. Will the alkalinity of Dickey Lake affect fish life or any other organism?

4. Haven't the early spring and fall plants been neglected, thus, making the plant survey incomplete?

5. The insects and arthropods are neglected in the study. Particular neglect in reference to the reservoir flood zone and in effect just the river bed area is covered, shouldn't this be corrected?

6. What will be the downstream effects of the dams? Specifically sediment loads, erosion effects, and nutrient loading aren't considered, can this be corrected?

7. What will be the long term effects of decomposition of submerged forests on water quality? (Schindler assumption #3 doesn't seem relevant to Dickey).

8. Have all of the inputs to nutrient loading been considered? Isn't there a need to address the effects of recreational development on nutrient loading?

9. Are the trout stocked or native?

10. Is the reference to Utah reservoir mercury content a fair comparison to Dickey-Lincoln?

11. There is more incidence of mercury evident in fish in the Allagash. Has this been studied?

12. What effects do dikes on the tributary streams have on littoral zones (flora and fauna)?

13. What is the basis for the conclusion that conditions would be ideal for certain insects? (See reference page 58, second paragraph, sentence beginning "The standing forest...").

14. What are the top carnivore feeding extensively on fish and what is the significance of their absence?

15. Have sedimentation, eutrophication, etc., been projected for the life of the reservoir? What is the basis for determining anticipated projected life?

16. How does the anticipated Dickey sport fishing productivity conpare with other Maine lakes? Is it good, bad, or average? (Reference page 95, chart page 93).

17. Is the information on which the thermocline are located adequate? Do you feel data are adequate to predict thermocline location in Dickey-Lincoln reservoir?

18. What is involved in pumped storage?

19. What is the effect of pumped storage on limnology of the reservoir?

20. What is the justification or documentation for predicting white suckers will be only fairly successful?

21. What is the basis for describing sculpin as significant forage fish or game fish?

22. What is the basis for the statement that yellow perch won't proliferate in reservoir?

23. What is the basis for describing brown bullhead as not a game species?

24. What is the basis for the statement that the three spined stickleback won't be an important game fish?

25. Where did the high mercury in the Allagash fish come from?

26. If the mercury content is all that bad, why push for the development of lake trout fishing?

27. Do the long distances required to travel to this area preclude the development of fisheries?

May 25, 1977 04330

Mr. Charles O'leary
128 College Avenue
Orono, Maine 04073

Dear Sir:

This is to put in more definite terms some of my objections to the "Aquatic Ecosyst - - -" workshop May 24, as requested. Basically I do not feel that Maine can afford to lose 135,000 acres for the dams and reservoirs, have 200,000 more cut off, and a great transmission line swath taken through its northern wilderness, a large part in its low-lying finest timberlands, with a very large annual production of timber, game and other values. To Maine that would be a catastrophe of the first order. The cost-profit ratio I have seen seems badly distorted, and if a business man had to figure such it would be a very unprofitable undertaking. The difference must come out of the American taxpayer. I know that in southern New England man's desires for energy has so outrun the practical supply that before water of a Dickey Dam ever turns a turbine there will be more moves to dam Maine rivers for still more energy, and no end.

The "STUDIES" portion of the life of the area, littoral and reservoir areas, of the project are quite unsatisfactory to me, most unrealistic for invertebrate life and shoreline plant life. Maine's natural lakes have been thousands of years in develop- shoreline ecosystems; and the problem is multiplied by drawdown. At the time I raised questions concerning the lower paragraph on p. 58. From what I know of the progression and decay of largely coniferous debris and wood underwater this projection is utterly unrealistic. This is indicated to be at a considerable depth. The numerous distant and foreign references are practically without any substantiating information and without such I consider practically worthless. One study on a somewhat comparable Maine reservoir would be so much more informative. During my collecting season in central Ungava I worked around many lakes the Swedes had in their botanical studies. Condition are greatly different. The projection of the food chain for life seems fanciful. Without a food chain with all links present there will be little, and little above the invertebrates. In this connection I spoke of "benthic" as referring to deep water and was picked up by 2-3 at the time, one saying that benthic water occurs in a beaver som ponds. My large Webster's Dictionary confirms my usage by origin and use. I called a game biologist and questioned him. He said most are shallow, under eight feet, and a deep one would be fifteen feet.

Of what Nature gave Maine this State has already lost too much. The woodland caribou, Labrador duck, great auk, wild turkey, heath hen, passenger pigeon, and others are gone, still others essentially so. A considerable number of plants are endangered or rare. At the only known little spot for the prairie fringed orchid none have been found the last two years. In the outstanding unique ecological area in the lower portions of Maine, the bed of the St. John River several endangered species occur, which are to be found nowhere else in the 48 states, and with them additional rare species. Filling the Dickey-Lincoln reservoirs will eliminate in one fell swoop these species. This is a situation which should not be countenanced, too many imperative reasons for their preservation exist. In Maine there is no other comparable area. In July 1976 I stood in one of these flower areas within the banks of the St. John with two widely experienced Maine field workers. I asked them if they had ever anywhere in the State seen the equal of the flowers there, and both quickly replied that they had not. Such is the bounty that area contains. These plants have come in from the eastward and nearly all stop there, being in none of the other 48 states. Any-one who has seen and investigated the Wild Gardens of Acadia in Acadia National Park knows there is a phenominal increase in interest in these forms of life and in their preservation. We have every reason to believe that with these there are insect species which depend upon single plants or genera for their existence. These have not been investigated.

Sincerely,

A. E. Brower

A. E. Brower

1973

Proceedings of Dickey-Lincoln School Lakes Workshop

Subject: Recreation

Date: May 24, 1977

Location: Augusta, Maine

Moderator: Charles O'Leary Recorder: L. Kenneth Fink, Jr.

This workshop was conducted for the purpose of obtaining an input from Maine organizations to the technical review of the scope and content of the Dickey-Lincoln project studies which are directed toward determining the environmental impact of the project. The topic of this workshop was recreation.

The participants in this workshop included invited panelists, Corps of Engineers personnel, and the Corps' consultants who had the primary responsibility for preparing the technical documents to be used in the EIS.

The panelists in this workshop and the affiliation of each are as follows:

Mr. Arthur Bearce
Appalachian Mountain Club

Mr. Thomas Cieslinski
Maine State Bureau of Parks and Recreation

Mr. William Fake
Appalachian Mountain Club

Ms. Mary Grow
Maine Division, American Association of University Women

Ms. Florence G. Hoar
Maine League of Women Voters

Ms. Ruth Irwin
Maine League of Women Voters

Mr. John Joseph
Maine Outing Club, University of Maine

Mr. Joseph M. Lupsha
Marine Forest Products Council

Mr. Louis Pompi
Maine Outing Club, University of Maine

Mr. William F. Stearns
Penobscot Paddle and Chowder Society

The Corps of Engineers personnel were:

Col. John Chandler, New England Division
Mr. Richard Riordan, New England Division
Dr. Bud Barrett, New England Division
Mr. William McCarthy, New England Division
Mr. Larry Grossman, New England Division

The consultants who prepared the technical information for the recreational considerations in the EIS were present to answer the questions of the panelists and present further explanations where necessary. The consultants were:

Mr. Kenneth Arndt, Director of Planning, Northern Maine Regional Planning Commission
Mr. Stanley Goodnow, Land Use Planning, Inc.
Mr. Noel King, Economist, Northern Maine Regional Planning Commission

A general introduction to explain the purpose and specific objectives of the workshop was given by Mr. Charles O'Leary and additional introductory remarks were presented by Col. Chandler. Following the introductions, the panelists formulated a total of twenty-eight questions which are listed in Appendix A. It should be noted that this list of questions was based on the technical information previously provided by the consultants through the Corps. After the question formulation session and a short break, the consultants brought forth a revised recreational study and a series of wall maps which represented additional findings and support for their earlier results. This produced some problems in continuing the workshop since the principle was to have the panelists base their queries and comments on studies with which they were already familiar. In the subsequent questioning of the consultants it was generally agreed upon by the panelists that the new information did not always change or preclude a question that was based on the work with which they were already familiar.

During the course of the exchanges between the consultants and the panelists, both groups agreed that it is in this topic area that the

greatest potential for a clash of group and individual value systems is realized.

A general concern discussed early on is the validity of the basis for the figures used in the recreational use projections. The strong differences of opinion seemed to be the result of differences in the concept of personal preferences.

Most of the concerns expressed revolved around the particular methodology used and in several instances the assumptions underlying a methodology were questioned. After much discussion and clarification, the situation resolved itself into a state of comprehension on the part of the panelists but without conviction. This was the case for questions 1, 3, 4, 12, 16, and 26.

In addition to the validity questions, there were specific concerns about the adequacy of the data provided in answer to some questions, e.g., 1, 2, 20, and 23.

It was question 12 which was chosen by the panelists as the most important one, philosophically, and the most difficult to answer, technically. In summary the workshop participants recognize the great problems in attempting a) to answer the fundamental question of exchanging a non-reproducible resource for a peak power generating facility, or b) to assess the unique qualities of the St. John. The importance of these questions is not diminished by their degree of difficulty.

There were some questions posed for which answers are still being prepared in the continuing process of preparing the draft EIS, e.g., questions 13, 15, 20 and 23.

There was a request from some panelists for a glossary and an explanatory appendix.

In response to a request by the moderator, one letter was submitted by Ms. Florence Hoar to emphasize particular difficulties which she had with the recreational study. This is included as Appendix B.

WORKSHOP ON RECREATION - APPENDIX A

Questions formulated by panelists

1. How accessible will areas of Dickey-Lincoln be for recreation?
   a) are projected day use figures on p. 30-A valid?

2. a) Has Corps considered diminishing energy availability in calculating its anticipated use figures?
   b) Has Corps contractor considered other day use deterrents in calculating day use figures?
   c) clarification of day use terms?

3. Is comparison of Dickey Lake with Moosehead Lake valid?
   a) Why hasn't Flagstaff Lake been considered as recreational equivalent?

4. Is methodology used in determining recreational potential valid?

5. pp. 16 & 17 -- What are intervening opportunities? Are all of these properly considered?

6. p. 58 -- What is justification for two sets of figures used in recreational benefits before & after 1988? How were these determined by water resources council?

7. How will current recreational activities in areas not within inundated area be affected?

8. How will mudflats affect recreational potential?

9. How were driving distances determined?

10. Explanation of missing tables and figures?

11. Cost?

12. Has question of irreversible loss of non-reproducible resource been assessed?

13. Why haven't all alternative uses of river been considered?

14. p. 57 -- Table IX -- Is figure an estimate? How final is it?

15. Are results of N. Maine Woods Corp. comprehensive plan incorporated into recreational assessment?

16. p. 33 -- What is validity of projecting salmon and togue fishery as Dickey-Lincoln benefit?

17. Should this study have considered a mitigation or compensation for lost whitewater canoeing? If not, why not?

18. p. 60 -- Table X-4 -- What is basis for 3.5×10^6 figure?

19. Need for Glossary!

20. Why is there no obvious maintenance expense considered in evaluating recreational benefits?

21. What is basis for projection of increasing recreational use?

22. Why wasn't a gross benefit or cost calculated for alternatives?

23. Why is there no justification or presentation of just how much area would be classified in each slope category?

24. p. 35 -- What escape mechanisms are available for canoeists at impoundments?

25. Have consultants discussed land use issues with LURC?

26. Have the qualities of length and remoteness been considered and compared to other rivers along east coast?

27. p. 58 -- para. 1 -- a) What does term consistent mean?
b) What, in a conceptual sense, is a recreational benefit, how measured?

28. What is relationship between visitor day figures with and without versus recreational benefits with and without?

APPENDIX B

Letter from Ms. Florence G. Hoar

RFD #2
Winthrop, Maine 04364
May 25, 1977

To: Ken Fink
From: Florence G. Hoar, League of Women Voters of Maine
Re: U. S. Army Corps of Engineers Workshop: Recreation, May 24, 1977, Augusta, Maine

The material available for study before the workshops was incomplete; tables VI, 3-10, footnotes, and Bibliography were missing. Other tables were incomplete or had conflicting figures. No figures (plates) were available for study, which made visualization of the plan difficult.

New material including figures (plates), presented at the workshop rectified the situation somewhat, but tables VI, 3-10 were still missing, and the bibliography was still unavailable.

Actual presentation of the material by Northern Maine Regional Planning Commission personnel and Land Use Consultants, Inc. was good. They appeared to have taken a logical approach to planning a recreation situation which, according to them, has no applicable precedent. I cannot concur with their approach, however, partially since the source material is unknown.

I f eel a combination of their approach with figures available f rom Flagstaff Lake, and the Allagash Wilderness Waterway would be more reasonable for visitation figures in all areas (hunting, fishing, camping, etc.) both before and after impoundment.

The consultants' comparison of Lake Dickey with Moosehead in the area of kinds of recreation to be expected was unsupportable.

I am not satisfied that the problem of access was properly or thoroughly enough addressed, from the standpoint of roads, of energy availability, and of forest management practices.

Considering the fact that northern Maine has over 106 natural lakes, the majority of which are currently underutilized (p. 19), it is difficult to visualize much recreation potential besides sightseeing for Dickey Lake. Certainly, even with the approach the consultants used, it is apparent that there is little economic benefit to be gained through recreation.

DICKEY-LINCOLN SCHOOL LAKES

HYDROELECTRIC PROJECT

WORKSHOP PROJECT

Energy Utilization and Power Alternatives

2:00 P.M., May 25, 1977

Room 302

Center for Research and Advanced Study

University of Maine at Portland-Gorham

Moderator: David Smith
Council for the Humanities
and Public Policy
P. O. Box 7202
Portland, Maine 04112
(207) 773-5051

Recorder: H. Nelson Upthegrove
New Enterprise Institute
CRAS/UMPG
246 Deering Ave.
Portland, Maine 04102
(207) 773-2981, X472

Assistant: Greg Deprez
New Enterprise Institute
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246 Deering Ave.
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Participants:

Margaret Vaughan
League of Women Voters, Maine
Elm Hill Farm
Hallowell, Maine 04347

Paul W. Coleman
Houlton Water Co.
P. O. Box 726
Houlton, Maine 04730

David Rolfe
S D Warren Co.
89 Cumberland St.
Westbrook, Maine 04092

Roger Williams
Energy & Environment Committee
Maine State Chamber of Commerce
477 Congress Street
Portland, Maine 04111

G. Melvin Hovey
209 State Street
Presque Isle, Maine 04769

Joseph Pecarraro
Federal Energy Administrati
Region I
150 Causeway Street
Boston, Mass. 02114

Alberto Goetzel
38 Deering Street
Portland, Maine 04101

The Corps of Engineers and its contractors were represented by:

Col. John Chandler, COE

Mr. Larry Grossman, COE

Mr. Bud Barrett, COE

Mr. Dick Reardon, COE

Mr. John Lawrence, Acres American, Inc.

and others.

Procedure

Mr. Smith opened the workshop at 2:00 o'clock. The panel participants were asked to introduce themselves, and Mr. Smith gave a general introduction to the workshop, stating the purpose of the workshop series and outlining the procedures to be followed.

Col. Chandler introduced members of his staff and contractor representatives. He briefly reviewed the history of the Dickey-Lincoln Project, described its current status, and discussed tentative schedules for subsequent steps in its development.

Since there were no questions regarding the background of the workshop and the details of the procedures, Mr. Smith opened the discussion for questions.

The questions and the gist of the answers provided by the COE and its contractors are included in this report.

The questions reflected concerns in both the Energy Utilization and Power Alternatives areas, with some overflow into Project Economics and Power Marketing.

Some of the participants embodied experience and competence in pertinent fields, and their questions and contributions reflected this. The questions raised did not define a cohesive or conscentrated patterns of concern. This was in contrast to the essentially single theme pattern of the evening session on Project Economics and Power Marketing. In part, this difference was perhaps due to the difference in the bulk of the advance material. The ACRES AMERICAN report was overwhelming in its size and detail. Few, if any, of the participants had been able to thoroughly study and absorb it. Nonetheless, most of the questions, and the audience comments, seemed to reflect a general desire for demonstration that the appropriate collection of parameters and influences had been considered and that none of potential signi-

cance had been omitted. The general tenor of the concerns might be summarized in two generalized questions:

1. While the Utilization and Alternatives study has been thoroughly and responsibly conducted, it should be noted that the data for the study, as well as the constraints placed upon its scope and methodology, are all derived from the past. Isn't it likely - or probable - that, in this time of rapid change, the results of the study will be invalidated before the plans based on the study can be implemented?

2. Isn't there some practical alternative to a massive project in an area noted for other special values? Have "we" really used our best imagination and technology in exploring alternatives?

Observations

This Recorder observed three other workshops in the series and participated in two; Energy Utilization and Power Alternatives, and Project Economics and Power Marketing, on May 25th. Beyond the specific content of each workshop, the following observations seem pertinent:

1. The proposed Dickey-Lincoln project itself, the number and variety of pertinent background data, the need for consideration of many alternatives, and the number and variety of points of view of interested parties add up to an extremely complex situation. Hence, the DRAFT EIS and the supporting studies are inevitably complex undertakings. It is not clear that the real scope and complexity of effort and information encompassed by the DRAFT EIS are widely understood.

2. The sheer bulk of the material involved is an obstacle to effective communication and understanding. This problem will be aggravated as the DRAFT EIS develops.

3. There is a critical need for more rigorous and precise language in the communication process. Establishment of unambiguous terminology would contribute much. The whole process is intended to provide a basis for valid comparisons and value judgments. These are impossible unless comparable assumptions, equal performance specifications, etc., are established and accepted à priori.

4. The questions reflect special and/or local needs, problems, and interests. People have various degrees of

awareness of and grasp of the reality around them. Few people seem able to extrapolate this small-scale, individual sense of the world to a feeling of personal identification with large scale proposals and projects. Most people have little basis in their experience or training for dealing with projects involving billions of dollars, decades of time, and thousands of participants. Further, most people are unfamiliar, if not uncomfortable, with the methodology of aggregation and statistical analysis so often used in planning and analysing large scale endeavors.

5. People seem to underestimate the difficulty of forecasting and controlling future events. Perhaps the era of technology (system engineering) and big government has erroneously led the public to believe it can be done. Even in large industrial organizations, acceptance of statistically developed planning to reflect real uncertainties has been slow. In a larger, qualitative sense, it seems that there is a lack of appreciation of the significance and magnitude of the interactions with our society's characteristics, such as life style, work patterns, etc., that are implicit in consideration of what appear to be "simple" technological and economic alternatives.

6. It seems clear that the COE truly does take a posture of openness and receptivity. Additions to and changes in the EIS will be possible in response to constructive comments, criticisms, and questions.

7. Members of the public and interested parties, regardless of their point of view, should take advantage of the Corps' posture to help the COE prepare a more complete and accurate EIS.

Questions

1. (Mr. Pecarraro)

   a. Does the DRAFT EIS consider the effect on the U.S. balance of payments of various power operation alternatives to the use of imported residual fuel?

   b. Does the DRAFT EIS adequately weigh the environmental, economic, and energy balance effects of using coal as an alternate power generation source?

Answer: (Mr. Lawrence)

Basically, to (a.), No. October, 1975, situation was used in the study; oil was cheapest fuel. To (b.), there was no indication, in October, 1975, that there was a developing trend for coal to become a major fuel in New England.

2. (Mr. Hovey)

The estimated cost of $642/kw seems low compared to other projects. Can the project be built for $642/kw installed?

Answer: (Mr. Reardon)

The answer is No. The $642/kw figure is based upon October, 1975, costs, with no escalation.

Comment: (Mr. Starrett, audience.)

D-L is planned for peak power. If the site were used for base load, installed capacity would be much reduced, and cost/kw would be comparably higher.

3. (Mr. Rolfe)

In developing the modified demand projections, what types of demand controls were assumed? How did they affect the projections?

Answer: (Mr. Lawrence)

See pages 3-72 through 3-78 in the ACRES AMERICAN report. A variety of controls were considered and effects were based on data from various sources and tests. The estimated effect on projected peak demand was a reduction less than ten percent of the peak value.

4. (Mr. Goetzel)

Did the study consider demographic and industrial trends in forecasting demand?

Answer: (Mr. Lawrence)

The demand forecasts were based on data from major utilities. They address sectoral demands and normally introduce trend data into their projections.

5. (Mr. Rolfe)

To what extent did the study consider the effects of evolving federal and state energy policies or various fuels and sources of

energy discussed in this report?

Answer: (Col. Chandler in connection with Question 1.)

The DRAFT EIS is being (and is required to be) conducted under existing policies, rules, etc. If new policies are established, a re-examination, etc., may be required.

6. (Mr. Coleman)

Has the study adequately considered the alternative of many small hydro sites in New England?

Answer: (Mr. Lawrence)

See pages 5-30 and 5-71 in the report. Cost per KW is inversely related to size. The study actually considered only a few large sites which might be economically attractive.

Answer: (Col. Chandler)

Under 1973 Congressional Directive and 1977 Presidential Order, COE is looking at small hydro sites on a national basis. Results should be available in 1979.

Answer: (See also Answer to No. 7.)

7 (Ms. Vaughan)

Has the study given adequate consideration to a mix composed of many various, "small" sources, including conservation?

Answer: (Mr. Lawrence)

The study was done under the constraint that no source too small to affect the price of power in N.E. was to be considered. Cost per/kw works against this idea. Nonetheless, the study did look at, e.g. fuel cells and wood fired plants. They both were more costly, and near term development to appropriate scale is anticipated.

8. (Mr. Williams)

How much power will stay in the State of Maine?

Answer: (Mr. Reardon)

100 MW of intermediate load factor power and 100 MW of peak Power.

9. (Mr. Goetzel)

What are the specific peak power needs to be served by Dickey-Lincoln? (Ultimate users.)

Answer: (Messrs. Reardon, Lawrence, with comments.)

About 5,000 MW of NE's 24,000 MW 1980's demand is "peak power". Dickey-Lincoln will supply about 17% of this. The peaks are the result of combined demands and cannot be associated with a single class of user or users. Peak power in NE is usually winter evenings when businesses and residential load patterns overlap.

10. (Mr. Hovey)

In the report preparation, has there been sufficient coordination with NEPOOL to ensure provision of back-up for Dickey-Lincoln maintenance periods, etc.?

Answer: (Messrs. Lawrence, Reardon, Wilkinson (Dept. Int.))

Spare capacity is planned internal to D-L. There has been close collaboration with NEPOOL since 1975. D-L planning meets NEPOOL criterion for a major installation.

11. (Mr. Burnett, audience)

Has the study considered new Canadian sources of power, particularly Quebec Hydro's James Bay plant, as an alternative supply for New England?

Answer: (Mr. Lawrence)

No; there has been no specific consideration of Quebec Hydro per se. The study has assumed that at least 200 MW would be purchased from outside N.E.; it was presumed to be from converted thermal plants.

H. Nelson Upthegrove (Ret.)

H. Nelson Upthegrove

HNU:leb 6/21/77

RECORDER'S REPORT

Dickey-Lincoln Workshop

Project Economics and Power Marketing

Center for Research and Advanced Study

University of Maine, Portland

May 25, 1977

David Charles Smith, Recorder

RECORDER'S REPORT: DICKEY-LINCOLN WORKSHOP ON PROJECT ECONOMICS AND POWER MARKETING, MAY 25, 1977

The participants at the 7 p.m. workshop on Project Economics and Power Marketing were:

Paul Coleman, General Manager, Houlton Water Co.

Alberto Goetzel, graduate student in forestry and environmental management, Duke University

Melvin Hovey, Assistant to the President, Maine Public Service Co., Presque Isle

Joseph Lupsha, Executive Director, Maine Forest Products Council, Augusta

Joseph Pecararo, Federal Energy Administration, Boston

William Shipman, Professor of Economics, Bowdoin College, Brunswick, Me.

Roger Williams, observing. The Maine State Chamber of Commerce

Dr. H. Nelson Upthegrove, Director of the New Enterprise Institute, Center for Research and Advanced Study, University of Maine, moderated the discussion and made excellent arrangements for facilities and hospitality for the entire day's program.

The U. S. Army Corps of Engineers was represented by Colonel John Chandler Head of the New England Division of the Corps; Dick Reardon, Project Engineer; and Steve Rubin, Economist. Additional contractors/consultants who had major responsibilities for answering questions on marketing were Harry Wright from the Southeast Power Administration, and Marty Thorpe from the Federal Power Commission. Other consultants were present,

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and the audience numbered about twenty persons.

The workshop proceeded entirely according to plan. After a brief presentation by Colonel Chandler on the background to and status of the draft EIS, workshop participants generated a set of eleven questions relating to the sections of the EIS under discussion. (A list of these questions is appended.) Corps personnel and consultants addressed all of the questions. It was the general consensus of the group that all the questions which could be answered were answered. Discussion was tight and concise, and followed the agenda topics.

The main concern pursued throughout the discussion was costs and benefits: their type, their calculation, and for whom.

With regard to the calculation of project costs, the discussion centered upon the methodology of undertaking this complex task in a time of general inflation. The complexity of the various types of costs, the impossibility of including in political or economic contingencies in the calculations ("what if ...."), and the relation of the economic to the fiscal approaches were specifically discussed.

From this general exchange on benefit/cost, the discussion moved to the central consideration of the evening, the benefit vs. cost to Maine. As one participant put it, "Is

the benefit to Maine worth the cost in terms of the loss of timber land, a wild river, etc." There was general agreement with Colonel Chandler's response that there is no way to answer this question completely scientifically, because of the many intangible considerations involved. However, the Corps economist gave a clear explanation as to how the value of the timberland had been calculated and how this method took into account renewable resource aspect.

As to benefits for Maine, consultants focused upon the power benefits, and discussed (Dickey) peak, (Lincoln) load, and (Canadian) downstream benefits to Maine.

This was the general fabric of the discussion. Within the discussion, two questions or issues emerged in a more specific and focused way, and warrant passing on to the Corps for consideration.

First of all, since the Corps is not limited in the EIS to the methodologies of calculating benefit/cost already used, should a return-on-investment approach be taken, and if so, at a wider variety of interest rates? A life-cycle approach of comparison with alternatives was also suggested.

The second question, posed by Professor Shipman, really addressed the power alternatives section of the EIS. He noted that the Acres American study concludes that gas turbine plants are the most viable alternative to Dickey for peak power in New England in the period of study. Prof. Shipman

observed that this conclusion is based upon calculations of present costs of construction and fuel. He believes strongly that significant increases in gas fuel prices will occur, and that consequently pumped hydro is really the alternative that deserves closest attention. In short, he feels that the method of basing calculations upon present costs has lead to a wrong conclusion.

The problem of possible rise in the price of one or another fuel seems to exemplify the sort of "What if ....." question which can open into an almost endless series of questions about the national and world economy, changes in public policy, etc., which make the task of calculating benefit/cost extremely difficult.

Respectfully submitted,

David Charles Smith

David Charles Smith,
Recorder

11. What is the relation of 200 MW to Maine's power needs? Will Maine use its share, or will it go to NEPOOL? (Mr. Burnett, audience member)

APPENDIX

QUESTIONS POSED BY WORKSHOP PARTICIPANTS, PROJECT ECONOMICS AND POWER MARKETING, MAY 25, 1977

1. The EIS cost estimate is based upon current costs (March, 1977). Should not the EIS include a serious effort to project power costs into the future? (Mr. Hovey)

2. Will the cost of power be the same to preference customers and others? (Mr. Hovey)

3. Can Dickey-Lincoln power be marketed at $15/Kw/yr - 3 mils/Kwh? (Mr. Hovey)

4. Has the Corps done any studies of benefit/cost using the current rate of long-term government borrowing? (Mr. Shipman)

5. Has any effort been made in the EIS or supporting material to define or predict the distribution of power benefits for Maine vs. out-of-state? (Mr. Shipman)

6. Is the selected alternative (gas-turbine) the right basis for cost/benefit comparison? (Mr. Shipman)

7. Should some combination of hydro, pumped storage, etc., be included as an alternative? (Mr. Shipman)

8. Has enough attention been given in the EIS to downstream benefits (Canadian dams) especially to Maine? (Mr. Coleman)

9. If the marketing plan is executed, is 200 MW of 900 MW sufficient compensation to Maine for the loss of land, wilderness, etc.? (Mr. Williams)

10. Does EIS address the economic loss of timber resources immediately and over life of project (considering timber as a renewable resource)? (Mr. Goetzel) (A further methodological question: How does the EIS calculate present and future value of the timberland? was raised by Mr. Steve Gonkel of E. C. Jordan)

UNIVERSITY OF MAINE *at Orono*

Department of Geological Sciences

110 Boardman Hall
Orono, Maine 04473
207/581-7077

June 23, 1977

John P. Chandler
Colonel, Corps of Engineers
Division Engineer
Department of the Army
New England Division, Corps of Engineers
424 Trapelo Road
Waltham, MA 02154

Dear Colonel Chandler:

Thank you for your letter of 14 June. It prompts me to pass on some comments and suggestions that I have received from several members of the State geological community since I participated in the April 27 workshop.

There seems to be considerable feeling that input into the Dickey-Lincoln project by the State geological community has not been adequate. Apparently some were not notified of the April 27 workshop. A suggestion that has been made is that there should be a further meeting, planned well in advance, where Maine geologists could meet with the Corps and its experts to discuss the scope-of-work. The scheduling and organization of such a meeting should be done jointly by the Corps and someone, perhaps from the State Geologist's office, representing in-State geologists. This would ensure proper representation at the meeting by Maine geologists. In addition, it has been suggested that the in-State group should bring in outside experts where expertise important to the project is not locally available.

Mr. Richard Barringer, Commissioner of the State Department of Conservation, recently sent me copies of pertinent correspondence between his office (15 June) and Mr. Fryar (9 June) of your Engineering Division. Because of this I am sending a copy of this letter to Commissioner Barringer.

Sincerely,

Brad Hall

Bradford A. Hall
Professor and Chairman

xc: Commissioner Barringer

WORKSHOP REPORTS

FOLLOW-UP ACTION THROUGH 26 JULY 1977

As of 26 July, all reports have been received from recorders except Cultural Resources and Economic Impacts.

All reports being reviewed and follow-up action will be taken on subject matter judged worthy of added study. The review is proceeding at best possible pace consistent with present heavy demands placed on staff to complete draft EIS, revised GDM and respond to continued public inquiries.

Following post-workshop actions have been pursued.

A. GEOLOGY & SEISMIC FACTORS

1. Seismic

a. Professor David Slemmons (Mackay School of Mines, University of Nevada) consulting geologist who reviewed the Krinitzsky report accompanied Dr. Krinitzsky on a ground surveillance of Dickey dam site on 23-24 May 1977. Overflight by Professor Slemmons is being scheduled. (Site visit did not reveal anything to alter report findings).

b. Question on need for added bedrock geology to define seismic potential was posed to Dr. Krinitzsky. He feels no added bedrock geology is required. There is no evidence of a capable or active fault at project site. However, should in fact any existing lineament be confirmed as a fault, the potential earthquake magnitude, intensity and motions would be less than the design criteria developed which is based on an attenuated St. Lawrence Valley event that exceeds anything on record.

2. Minerals

Letter sent to Maine Dept. of Conservation requesting scope of work from its Bureau of Geology for mineral survey within appropriate areas of impoundment. Dept. of Conservation has noted by letter of 15 June a scope will be jointly prepared by State Geologist and University of Maine-Orono Geology Department.

B. POWER ALTERNATIVES

1. Conservation & Pumped Storage

a. Corps consultant will conduct the following additional studies:

(1) Evaluation of non-structural alternatives, i.e. further conservation, required to reduce peak power demands in amount equivalent to Dickey-Lincoln School output (944 MW). This reduction will be applied to the modified load curve that presently reflects reductions due to conservation and load management.

(2) Evaluation of project economics using pumped storage system expansion as a base case in lieu of the all fossil expansion case presently used.

(3) Further evaluation of the feasibility of external power purchases as alternative to the project.

C. TERRESTRIAL

1. Vegetative Classification

Corps consultant will provide additional land cover mapping for area north of impoundment bounded by Little Black and Big Black Rivers (often referred to as "isolated" area).

2. Forest Economics

A meeting was held 27 June with Forest Economist (Mr. Thomas Corcoran of University of Maine, Orono) to identify logical areas in need of further study and discuss development of scope of work.

D. CULTURAL RESOURCES

Workshop participant cited potential site of Indian burial ground not included in consultant report. Location has been checked by consultant. Negative finding.

E. AQUATIC ECOSYSTEM

Contract negotiations underway to perform further investigations into mercury and selinium content in fish, water and sediment of the project area.

UNIVERSITY OF MAINE

A Division of The
Office of Research
& Public Services

July 22, 1977

Dean Gordon Haaland
College of Arts and Sciences
105 Stevens Campus

Dear Gordon:

I am enclosing a copy of the Recorder's Report from the workshop held June 28, 1977. I hope this information is satisfactory and meets with your approval and the approval of the Corps of Engineers.

Thank you for the opportunity to participate in these workshops. I found the experience both educational and fun.

Sincerely,

Charles J. O'Leary
Director

NEW ENGLAND DIVISION
U. S. Army Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02154

DICKEY-LINCOLN SCHOOL LAKES
Hydroelectric Project

Workshop

Terrestial/Aquatic Ecosystems

Tuesday Evening, 28 June 1977

at 7:00 PM

Hilltop Conference Center
University of Maine
Orono, Maine

Report of Charles J. O'Leary
Recorder

71

On the afternoon of Tuesday, June 28, 1977, a series of meetings were held at the University of Maine at Orono campus to develop questions regarding the workshop on Terrestial/ Aquatic Ecosystems to be held on the evening of June 28, 1977. The areas of concern included:

1. Fisheries
2. Forestry
3. Wildlife

Questions developed in these three areas include the following:

Fisheries

1. When will a decision be made regarding the clearing of timber in the reservoir? What will be the extent of such clearing?
2. What will mitigation be? What about compensation? What about trout streams? Are trout streams included in mitigation plans? Would there be a replacement of trout streams?
3. Who will be responsible for mitigation and how will these determinations be made?
4. How accurate is the water quality determination?
5. Has adequate consideration been given to the effects of drawdown?
6. Has the mercury problem been adequately considered?

Responses:

In his opening remarks Col. John Chandler asked participants

to consider the adequacy of topics covered and to identify the most important items to be included in the environmental impact statement. With this charge, the participants in the fisheries section felt a need to know more about the effects of drawdown. In addition, the participants indicated that the whole area of mitigation was unclear at this time.

Further concern was indicated in the estimate of fish (number of fish per acre vs. useage day). It was felt that the method used would be critical regarding mitigation and the state of Maine.

Forestry

1. Couldn't the definition of growth and volume be made more meaningful?
2. Is the 2,000 acre island accounted for in the economic impact statement? What about access to this area?
3. The economic impact was assessed only in Aroostook County, shouldn't consideration be given to assessing impact outside of the county?
4. Doesn't the statement on the harvesting of timber need elaboration and further consideration?

Responses:

Questions and concerns in this area are summarized in a post-workshop brief presented by Mr. Reginald Elwell, Chairman, Maine Chapter Society of American Foresters. (See attachment 1).

Wildlife

1. What methodology did E.R.T. use? What is the quality of the literature used? What is the importance of aerial observation?

2. Has the study provided sufficient base line data on rare and endangered species? What accuracy can be assigned to this base line data? Can we improve the base line data?
3. There is a noticeable absence of the mention of water fowl data. Is this an oversight?
4. Shouldn't more consideration be given to soft wood cover for deer and other species?
5. Will there be an economic analysis in reference to wildlife loss?
6. What will mitigation cost? The report considers static systems in its approach, shouldn't consideration be given to a dynamic system?

Responses:

Regarding the methodology of this section of the report participants felt that it was heavily dependent on literature rather than observations. It was felt because of this shortcoming that not all is known regarding the area of wildlife. It was further indicated that the choice of species should include rare as well as common.

One of the major areas of concern, however, was that there was little discussion of wetland habitat and that this represented a basic inadequacy in the report.

As indicated in other sections the wildlife workshop participants indicated a serious concern with the problem of mitigation.

Attachment 1

Maine Chapter

SOCIETY OF AMERICAN FORESTERS

55 Broadway
Bangor, ME. 04401

July 8, 1977

Mr. Charles O'Leary
University of Maine
128 College Avenue
Orono, ME. 04473

Dear Mr. O'Leary:

Enclosed are the written questions and statements presented at the joint Forestry, Fisheries & Wildlife Workshop on June 28th.

Please contact me if you have any questions regarding the enclosed.

Yours very truly,

Reginald B. Elwell

Reginald B. Elwell
Chairman

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Enclosures

Subject: Definition of Growth and Merchantable Volumes in Economic Impact Study

The definitions of growth and merchantable volumes in the subject report are misleading and have led to some unwarranted conclusions in the report.

Growth, as defined by "Timber Resources of Maine" from which growth figures were produced, is defined as that on all trees 4.5 inches DBH and up. Clearly, not all of these trees are harvestable and, therefore, not all of this growth is harvestable due to standards of merchantability and natural mortality which occurs in the size classes which are below merchantable size. To emphasize, there should be a clear distinction between <u>total</u> growth on trees 4.5 inches DBH and up and merchantable <u>growth</u> as applied to the standard characteristics of the impoundment area.

Because of the ambiguity created by this definition, the statement on page 15 of the subject report that only "50% of total growth is harvested" is also misleading. This is particularly important when it is recognized further in the report that 70% of the merchantable volume in the impoundment area is of sawlog quality and any management regime which emphasizes sawlog production would further limit the qualification of growth to a merchantable criterion.

It is the feeling among those acquainted with the area that a much higher percentage of the useable or merchantable growth as might be applied to the impoundment area is, in fact, being harvested at the present time.

The result of the analysis as stated is to discount or mitigate the loss of acreage as a timber production area. The information is misleading to decision makers who might conclude that the area is not being utilized from a timber production standpoint to its maximum potential and, therefore, its loss will not have a significant effect on the economic activity of the area. Growth rates should be restudied in light of the above and a re-evaluation made of the loss of the area in terms of merchantable volume and projected dislocation of the labor force.

DICKEY-LINCOLN TERRESTIAL AND ACQUATIC ECOSYSTEMS
WORKSHOP - JUNE 28, 1977
ORONO, MAINE

QUESTION:

We question the appropriateness of limiting the study of impact on forestry aspects to Aroostook County only. (Economic Impacts Summary, Dickey-Lincoln School Lake Project - May 1977). Most of the wood flows out of the County. The impacts will be felt over a wide area of the state and not just in Aroostook County.

MITIGATING PRACTICES

MITIGATING PRACTICES FROM A FOREST MANAGEMENT POINT OF VIEW. A MIX OF RESOURCE VALUES IS INVOLVED IN PUBLIC AND PRIVATE OWNERSHIP. RECOGNIZE THE FOREST RESOURCES AS ECONOMIC, WILDLIFE AND PLANT COMMUNITIES.

MITIGATING PRACTICES DISCUSSES THE PROJECT AREA AND ADJACENT AREAS AS THE SITES IN WHICH TO TRY AND REDUCE ADVERSE IMPACTS ON PLANTS, ANIMALS, AND WOOD PRODUCTION.

FROM A RESOURCE MANAGEMENT POINT OF VIEW, AN ECONOMIC FOREST MANAGEMENT TECHNIQUE IS OFTEN NOT SUITABLE FOR ENHANCING OTHER VALUES. THE TERRESTRIAL ECOSYSTEM ANALYSIS ASSUMES A VARIETY OF PRACTICES, BUT DOES NOT SPECIFY WHO WILL DO IT OR HOW.

MY QUESTION IS THEN, WHO WILL BE RESPONSIBLE IN BOTH THE SHORT AND LONG TERM FOR THESE MITIGATING EFFORTS, AND HOW WILL THIS BE ACCOMPLISHED IN A MEANINGFUL WAY.

JFC-6/28/77

DICKEY-LINCOLN WORKSHOP

June 28, 1977

UNIVERSITY OF MAINE - ORONO

RE: Section 3.1.1 - Economic Impact Summary - May 1977
E. C. Jordan Co., Portland, Maine

QUESTION:

E. C. Jordan Co. states there are 1.35 million cords of wood within the perimeter of the proposed Dickey impoundment. This wood, if harvested over a three year period, would equal 70% of Aroostook County's annual sawlog production and 36% of its pulpwood production. If the period of harvest were averaged over an eight year period (as proposed by Dick Reardon, U.S. Army Corps of Engineers), the amount of wood produced would equal 26% of Aroostook County's annual sawlog production and 14% of its pulpwood production.

E. C. Jordan Company states that even with a three year harvest of the 1.35 million cords, the timber and pulpwood would not be a glut on the Aroostook market if there is, "perfect reallocation of timber harvesting resources and time alloted for harvest." E. C. Jordan does not explain this general statement in their report.

My question is why a marketing analysis was not presented with their report to show how the 1.35 million cords could be marketed without the Aroostook County pulpwood and timber market suffering. In all likelihood, perfect reallocation of harvesting resources and time alloted for harvest will not be attained due to the large number of lumber, pulpwood and land management companies, who operate and/or own timber in the impoundment area.

Anthony Filauro
Research Forester

AF:Kp

Report on June 28, 1977

U.S. Army Corps of Engineers

Dickey-Lincoln School Lakes Project

Workshop

on

Water Quality

I. Participation

The workshop was moderated by L. Kenneth Fink, Jr., (moderator) and Bradford A. Hall (recorder). Participant names and affiliations were recorded by Corps of Engineers personnel.

II. Workshop format

Following introductory remarks by the moderator, a list of pertinent questions were generated by the non-Corps of Engineers participants. These questions (plus several others pertinent to water quality that had been generated in other workshops) were discussed by Corps and non-Corps participants. Conclusions arrived at through this discussion were presented in summary form by the recorder for the workshop participants. Questions and discussion summaries are outlined below.

III. Questions and discussion summaries

1. What will be the effects of timber harvesting, during and after construction, on water quality? Will there be a buffer zone (no cutting) adjacent to the reservoir, and what will be the effect on water quality?

   - There will be a no-cut buffer zone 300 feet wide or to an elevation five feet higher than lake level, whichever is

greater. Concern was expressed about the total effect of sediment runoff in the drainage basin by reservoir clearing and by simultaneous commercial timber harvesting. Could reservoir clearing preclude simultaneous commercial harvesting because the total sediment runoff might exceed established water quality standards.

Corps participants referred to pages 40-41 of design memorandum No. 5. It was indicated that sediment runoff resulting from reservoir clearing cannot be quantified. Runoff would be more difficult to quantify when coupled with non-integrated, simultaneous commercial timber harvesting.

2. What will be the downstream effect, water quality and ecological, of siltation interruption?

   - It was stated that only a small part of the St. John watershed was being impounded. A letter from Dr. Roland Struchtemeyer (University of Maine, Orono) to the Corps was read in part. It referred to graduate thesis research and indicated that particulate nutrient materials were of little importance to floodplain farmlands downstream of the reservoir. Workshop participants expressed little further concern.

3. What will be the downstream effects of nutrients being released from the impoundments?

   - Corps participants indicated that after reservoir equilibrium is reached, there will be a net downstream reduction of nutrients, but that the loss will not be significant. Workshop participants expressed no further concern.

4. What is the margin for error for calculations of temperature and dissolved oxygen in reservoir modeling?

   - Dissolved oxygen (DO) was not modeled because no such model exists. There is a possibility of low (?) DO in embayments. This is being considered and may result in a lowered elevation for clearcutting.

     Reservoir temperatures have been modeled. However, because of differences between the proposed reservoir and existing reservoirs the model has not been tested.

     The workshop participants expressed no concern with Corps efforts to consider these problems.

5. What significance is there to predicted lower water temperatures below the reservoir?

   - These temperature changes have been quantified by the Corps. The question was referred to a future workshop of aquatic and terrestrial ecosystems.

6. Does the Corps have wind-rose data for the reservoir area? What is its relevance to lake wave generation?

   - Only prevailing wind data are available for the area. Caribou, Maine, is the closest 1st order weather station with data adequate for a wind rose diagram. The Corps has conducted a wave generation analysis using available data and considering longest possible fetch. Until lake margins are stabilized, waves will result in erosion.

     See also question 16.

7. What will be the "nature" of the fine sediments in the reservoir after impoundment?

   - A one year study of suspended load tributary streams has provided data on total quantity of sediment. There has been no size analysis of this sediment, although Corps participants do not feel that the material is colloidal and will reach or bypass the dam.

     Participants expressed a need for more study of sediment size and for analysis of sediment transport in and through the reservoir.

8. What is the biogeochemical model for mercury (Hg) and lead (Pb) in the reservoir?

   - Corps analyses show high (and fluctuating) levels of Hg and Pb in watershed streams. They believe the source to be natural. Some elevation of Hg levels in existing natural lakes in the area is suggested by their data.

     Concern was expressed about the possible magnification of these levels in the reservoir. The Corps will be conducting further work on this problem during the summer of 1977.

9. Will there be a section (draft EIS and EIS) on scientific methodology, e.g., precision, accuracy?

   - No such section is currently planned. The need for such a section was strongly felt by workshop participants, in as much as it is difficult or impossible to evaluate and compare analytical data without a detailed description of the analytical techniques. The possibility of such a section (Appendix ?) was indicated by Corps personnel.

10. What will the detention time be after reservoir filling and pumpback?

- Question not considered.

11. Will there be gas bubbles below the Lincoln School dam due to nitrogen supersaturation?

- This might occur below Lincoln School dam because of spillway design. The Corps has considered its effects and will incorporate mitigating engineering developments.

12. Why are terms "holomictic" and "dimictic" used? Why not just "dimictic"?

- Question not considered.

13. Why is there an inconsistency in the elevations for minimum pool height (868 feet) and the lower limit of clear cutting (875 feet)? For vegetation with height greater than 875 feet, will the tops be removed?

- 868 feet is the level of the minimum power pool. 875 feet is determined as 5 feet below the once in 10 year frequency drawdown level. This is Corps criterion for non-water supply reservoirs.

  The tops of trees above 875 feet will be cut. Clear cutting may be to an elevation lower than 875 feet. The Corps analysis is not complete. The lower limit of cutting will involve considerations of fisheries and economics.

14. Will there be a section relating water quality to dam construction?

- There is a section in Design Memorandum No. 5. There will be some consideration of the question in the draft EIS. Final consideration will be in the EIS.

15. With regard to water quality, has the Corps considered the alternative of clear cutting?

- See question number 13 above.

16. What % of total acreage is the area represented by coves and embayments?

- Such areas have not been quantified (acreage, volume) but have been identified. It was pointed out by a participant that these are the important fisheries areas.

A discussion ensued that involved water temperature and ice cover on Dickey and Lincoln School Lakes and the erosional capacity of ice (particularly with large winter lake surface fluctuations due to drawdown). There was general concern about ice scour (and its relationship to wave action and erosion). Will these two factors allow for stabilization of lake shore sediments.

17. At what distance from the dam will meromictic conditions be destroyed by pumpback?

- It was stated that a meromictic condition would be temporary. Pumpback will later eliminate stratification and the meromictic condition. The workshop participants were satisfied with the Corps' assessment.

18. What is the effect of ice along the shore on sediment movement? What will be the general effect of thick ice on the surface of Lincoln School Lake?

- Lincoln School Lake may not have thick ice due to temperature of inflowing water and rapid lake level fluctuations. See also question 16.

IGC

19. What will be the impact of lake overturn, short term and long term, on nutrients, metals, etc.

- See questions 3 and 8 above. Question not discussed per se.

20. Has there been consideration of changes in Canadian land use and the effect on water quality?

- This has not been considered. The participants expressed concern and suggested that various "scenarios" be considered and assessment of maximum impacts be attempted.

IV. Questions deferred from previous workshops

A. Soils, Geology & Seismic Factors

#15. Floodplain farmlands downstream of the proposed project owe their fertility to some degree to nutrient addition during river floods. To what degree will the project affect this natural nutrient replenishment?

- See question 2 of part III above.

#16. Is sediment from impoundment tributaries a process that is important with regard to siltation and filling of the reservoir?

- See question 7 of part III above. This question is considered on pages 76-77 of Design Memorandum No. 5.

B. Terrestrial Ecosystems

4. What effect will construction activities have on aquatic systems?

- (Discussed in Aquatic Ecosystems) See question 14 of part III above.

#15. What will be the downstream effect of nutrients washing out from the impoundment area?

- See question 3 of part III above.

C. Aquatic Ecosystems

6. What will be the downstream effects of the dam? Specifically sediment loads, erosion effects, and nutrient loading aren't considered. Can this be corrected?

- See questions 2, 3, 5, 7, and 11 of part III above.

7. What will be the long term effects of decomposition of submerged forests on water quality?

- See Appendix C of Design Memorandum No. 5. Corps personnel stated that biochemical process are slow below 4°C. Changes in the lower limit of the clear cut zone (see questions 4 and 13 of part III above) may be considered to ensure that submerged debris is below the thermocline.

Several further questions related to the source of mercury polution. See question 8 of part III above.

Public Participation
By
Corps of Engineers

Public Participation by Corps of Engineers

A. Citizens Dickey Lincoln Project Impact Review Committee

1. Seven regular bimonthly meetings in Bangor, Maine
   - 13 April 1976, 14 June 1976, 16 August 1976, 4 October 1976, 6 December 1976, 8 February 1977 and 3 May 1977

2. Four Open Comment Meetings
   - 12 October 1976 in Portland, Maine
   - 14 October 1976 in Bangor, Maine
   - 14 October 1976 in Augusta, Maine
   - 20 October 1976 in Fort Kent, Maine

3. One Project Overflight
   - 19 October 1976

B. Public Workshops

1. Four Planning Phase and Coordination Meetings
   - 7 July 1976 in Augusta, Maine
   - 7 April 1977 in Orono, Maine
   - 15 April 1977 in Waltham, Massachusetts
   - 27 April 1977 in Orono, Maine

2. Fourteen Public Workshops

Date	Topic	Site
27 April 1977	Soils, Geology & Seismic Factors	Orono, Maine
10 May 1977	Energy Utilization & Power Alternatives #1	Augusta, Maine
10 May 1977	Terrestrial Ecosystems	Augusta, Maine
17 May 1977	Construction Impacts on Local Communities	Fort Kent, Maine
17 May 1977	Social Impacts	Fort Kent, Maine
17 May 1977	Economic Impacts	Fort Kent, Maine
18 May 1977	Cultural-Historic Values	Presque Isle, Maine
24 May 1977	Project Economics & Power Marketing #1	Augusta, Maine
24 May 1977	Aquatic Ecosystems	Augusta, Maine
24 May 1977	Recreation #2	Augusta, Maine
25 May 1977	Energy Utilization & Power Alternatives #2	Portland, Maine
25 May 1977	Project Economics & Power Marketing #2	Portland, Maine
28 June 1977	Water Quality Analyses	Orono, Maine
28 June 1977	Terrestrial & Aquatic Ecosystems	Orono, Maine

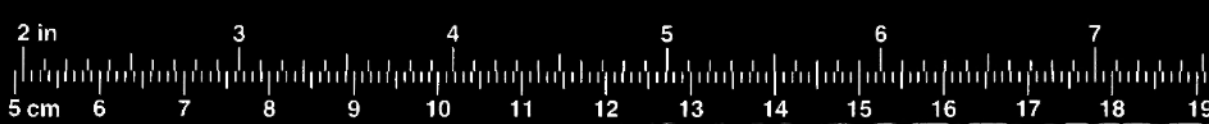
3. One Follow up Evaluation Workshop
   - 29 June 1977 in Orono, Maine

D. Staff Participation in Public Briefings

Date	Location	Audience
1974		
23 May	University of Maine at Ft. Kent	General Public
24 October	Northeastern University	ASCE Student Chapter
7 November	Harvard University	School of Design
12 November	University of Maine at Orono	Student Body
1975		
12 February	Univesity of Maine at Orono	Forestry & Wildlife Students
14 April	Bowdoin College	Environmental Studies Students
1 May	Ft. Kent	Rotary Club
18 June	Campobello Island, New Brunswick	International Committee on Water Quality
25 June	Allagash, Maine	Plantation Residents
16 October	N E Electric System, Westboro, Mass.	NEPOOL Planning Committee
19 November	Andover, Mass.	Institute of Environmental Sciences Merrimack Valley Chapter
20 November	Roger Williams College Bristol, R.I.	Student Body
25 November	MIT - Parsons Lab.	BSCE - Hydraulics Group
1 December	University of Maine at Orono	ASCE - Student Chapter

Date	Location	Audience
1976		
3 March	University of Maine at Orono	Forestry & Wildlife Students
16 March	NED Headquarters	FEA Energy Committee
13 April	Gov. Cabinet Room Augusta, Maine	Governor, Citizens Committee, Staff
27 April	NED Headquarters	Members of TRP & Federal Labor Agency Control Compliance
6 May	Fredericton, New Brunswick, Canada	Canadian Federal and Provincial Water Resource & Environmental Agency personnel
2 June	Augusta, Maine	ASCE - Maine Chapter
29 June	Rockport, Maine	New England Conference of Public Utilities Commission
17 August	Wallingford, Conn.	Annual Meeting - Northeast Public Power Association
14 October	Rockport, Maine	System Operators Committee, ECNE
16 October	Sugarloaf, Maine	Maine Chapter of Soc. of American Foresters
26 October	Augusta, Maine	Industrial Council of Maine
6 November	Auburn, Maine	AMC - Maine Chapter Annual Meeting
10 November	Concord, New Hampshire	IEEE - NH Chapter
24 November	Orono, Maine	Workshop - Timber Company interests
7 December	Orono, Maine	Atlantic Chapter of Canadian Society of Environmental Biologists Annual meeting

Date	Location	Audience
1977		
20 January	Cambridge, Mass.	7th Grade Classes Buckingham, Browne & Nichols Middle School
4 February	Augusta, Maine	National Resource Council
8 February	Newton, Mass.	IEEE - Boston Chapter
10 February	Boston, Mass.	Northeastern University Beta Society Student Chapter
1 March	University of Maine at Orono	Forestry & Wildlife Students
20 April	Portland, Maine	IEEE - Maine Chapter
28 April	Etna, Maine	Etna - Dixmont School
1 June	Calais, Maine	Management Club - Georgia Pacific Corp. - Woodlands Division
8 June	Orono, Maine	American Association of University Women
18 July	St. Francis, Maine	Town Officials
19 July	Allagash, Maine	Town Officials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